常熟开关　持续超越

- 国家创新型试点企业
- 国家重点高新技术企业
- 全国企事业知识产权示范单位
- 全国守合同重信用企业
- 国家科学技术进步二等奖获得者

B061508A19 07


常熟开关制造有限公司(原常熟开关厂)
CHANGSHU SWITCHGEAR MFG. CO., LTD.（FORMER CHANGSHU SWITCHGEAR PLANT）

公司地址：江苏省常熟市建业路8号
网　　址：http://www.riyue.com.cn
电子信箱：cskg0001@cs-kg.com
邮　　编：215500

ADDRESS:NO.8 JIANYE ROAD CHANGSHU，JIANGSU，P.R.CHINA
URL:HTTP://WWW.RIYUE.COM.CN
E-MAIL:cskg0001@cs-kg.com
POST CODE:215500

办 公 室：0512-52842237　52846851
元件销售：0512-52840577　52840993　52844994　52845227
　　52840995　52841441　52841442　52841616
成套销售：0512-52846862　52846863　52840073　52845582
技术热线：0512-52841486　4008282528
售后服务热线：0512-52846867　52846869　52844091　52845956
传　　真：0512-52841606　52841465　52841042

OFFICE :0512-52842237　52846851
SALES DEP. FOR ELECTRIC COMPONENTS:
0512-52840577　52840993　52844994　52840995
52841441　52841442　52845227　52841616
SALES DEP. FOR COMPLETE SWITCHGEAR EQUIPMENT :
0512-52846862　52846863　52840073　52845582
TECHNICAL SUPPORT HOTLINE：0512-52841486　4008282528
SERVICE HOTLINE：0512-52846867　52846869　52844091　52845956
FAX：0512-52841606　52841465　52841042




# CW 3 V系列智能型 真空万能式断路器

CW 3V SERIES INTELLIGENT VACUUM CIRCUIT-BREAKERS


2019年版

常熟开关制造有限公司
（原常熟开关厂）
CHANGSHU SWITCHGEAR MFG. CO.,LTD.
（FORMER CHANGSHU SWITCHGEAR PLANT）


**国家科学技术进步奖证书**
National Awards for Science andTechnology Cerificate


**国家科学技术进步奖证书**
National Awards for Science andTechnology Cerificate


**中国机械工业百强证书**
Top 100 China Machinery Industry Companies

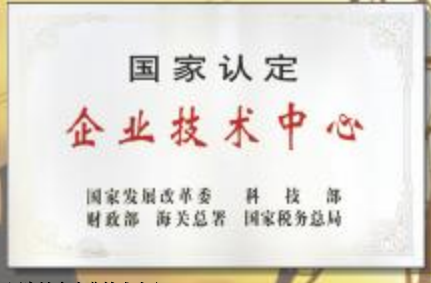

**制造业单项冠军产品证书**
ACBs award Individual Champion Product in Manufacture Industry


**中国合格评定国家认可委员会实验室认可证书**
Laboratory Accreditation Certificate rewarded by China National Accreditation Service for Conformity Assessment (CNAS)


**高新技术企业证书**
High-tech Enterprise Cerificate


**国家创新型试点企业**
National Innovative Pilot Enterprise


**国家级企业管理现代化创新成果**
The Innovation Achievement of Management Modernization of National Enterprise




**国家认定企业技术中心**
National Enterprise Technology Center


**博士后技术创新中心**
Postdoctoral Technical Innovation Centre


**改革开放40周年机械工业杰出产品**
Outstanding products of Machinery Industry for the 40th anniversary of Reform and Opening-up Policy

# 公司简介

## *Introduction*

常熟开关制造有限公司是国有参股的电器研发制造领军企业，注册资本3.8亿，现有员工1700人，专业研发和制造中低压配电电器、工业控制电器、中低压成套装置、光伏逆变器及光伏发电配套电器和智能配电监控系统及配套测控器件。产品广泛应用于电力、机械、矿山、冶金、石化、建筑、船舶、核电和新能源发电等领域。

常熟开关坚持自主创新，持续完善创新平台，不断提升公司的创新能力。2002年起，公司建立“博士后科研工作站”；2010年，公司被国家科技部评为“国家创新型试点企业”；2011年，公司技术中心获国家发展改革委员会、科技部、财政部、海关总署、国家税务总局联合颁发的“国家认定企业技术中心”；2013年，公司获批建立“江苏省智能电网配用电关键技术研究重点实验室”。公司拥有一支300多人的创新团队，所研发的技术和产品先后获得多项省市级以上荣誉，其中“低压保护电器关键技术的研究应用”项目和“开关电器大容量开断关键技术及应用”项目荣获国务院颁发的国家科学技术进步二等奖。

常熟开关坚持质量第一，注重全过程的质量管理，拥有一批先进的智能化、数字化的研发和制造管理系统和设备，公司检测中心获中国合格评定国家认可委员会颁发的认可证书。公司产品以优秀的性能和品质，深受用户好评，多次获得省部级质量奖。公司从1994年起参加的产品质量责任保险，至今无一理赔。

常熟开关致力于为用户提供精品电器产品，为社会、客户创造更高价值，打造一流的民族电器品牌。

Changshu Switchgear MFG. Co., Ltd. (Former Changshu Switchgear Plant), a national-leading enterprise with state-owned equity, registered capital of 0.38 billion RMB and 1700 staffs, professionally researches, develops and manufactures medium and low voltage power distribution electrical appliances, industrial control products, medium and low voltage complete sets of equipments, photovoltaic inverters & power generation equipments and intelligent power distribution monitoring system & supporting devices for observation and control, all of which are widely used in the fields of electric power, machinery, mining, metallurgy, petrochemical, construction, shipbuilding, nuclear power and new energy power generation,etc.

Changshu Switchgear insists on independent innovation, continuously improves the innovation platform and constantly improve the innovation capability. In 2002, the Post-doctoral scientific research workstation was set up. In 2010, an honor of the National Innovative Pilot Enterprise, issued by the National Ministry of Science and Technology, was awarded. In 2011, the National Development and Reform Commission, the Ministry of Science and Technology, the Ministry of Finance, the General Administration of Customs and the State Administration of Taxation jointly recognized the company’s technology center as the National-level Enterprise Technique Center. In 2013, the company was approved to establish the Key laboratory for Research on Key Technology of Intelligent Grid Power Distribution in Jiangsu Province.

The technology and products, developed by the innovation team consist of 300 engineers and technicians, have won a number of provincial and municipal honors, in which “The research and application on key technology of low voltage protection electrical device” and “The key technology and application of large capacity breaking of switching devices” have won the second prize of the National Science and Technology Progress Award.

Changshu Switchgear insists Quality-first and pays great attention on the quality management of the whole process. Advanced intelligent digital systems and equipments have been brought in for R & D and manufacture management. The company’s testing center has been rewarded the accreditation certificate issued by the China National Accreditation Service for Conformity Assessment. The products have won praise from users and also several provincial or ministerial quality awards for the excellent performance and quality. Meanwhile, no claims arise since 1994 when the product quality liability insurance was been covered for all the products.

Changshu Switchgear is committed to providing customers with high-quality electrical products, creating higher value for society and customers and shaping a leading national electrical brand.

# 常熟开关制造有限公司
# 为您提供电气系统完整的解决方案

## 高压真空断路器


CV1-12/CVR1-12系列
高压真空断路器


CV2-12系列
高压真空断路器


CV1-24/CV2-24系列
高压真空断路器


CV1-40.5/CV2-40.5系列
高压真空断路器

## 智能型万能式断路器


CW1系列
智能型万能式断路器


CW2系列
智能型万能式断路器


CW3系列
智能型万能式断路器


CW3X-1600系列
智能型万能式断路器


CW3R系列
智能型万能式断路器


CW3F-2500系列
智能型万能式断路器


CW3V系列
智能型真空万能式断路器

## 塑料外壳式断路器


CM3系列
塑料外壳式断路器


CM3E系列
电子式塑壳断路器


CM3L系列
带剩余电流保护塑壳断路器


CM3Z系列
智能型塑壳断路器


CM3ZL系列
带剩余电流保护塑壳断路器


CM3ZL/ZH自动重合闸
带剩余电流保护塑壳断路器


CM5系列
塑料外壳式断路器


CM5Z系列
智能型塑壳断路器


CM5Z-1600
智能型塑壳断路器


CM5L系列
带剩余电流保护塑壳断路器


CM5ZL系列
带剩余电流保护智能型塑壳断路器


CM5X-125塑料外壳式断路器
CM5XL-125带剩余电流保护塑壳断路器

# 常熟开关制造有限公司
# 为您提供电气系统完整的解决方案

## 自动转换开关


CA1/CA1B系列自动转换开关(CB级)


CAP1系列自动转换开关(PC级)



CAP2系列自动转换开关(PC级)


CAP3系列自动转换开关

## 接触器和过载继电器


CK3/CK3B系列接触器


CJR3/CJR3B系列热过载继电器


CJD3系列电子过载继电器

## 剩余电流动作继电器


CLJ3 剩余电流动作继电器

## 电动机软起动器


CR1系列电动机软起动器


CR2系列智能型电动机软起动器

## 电动机保护器


CD3系列电动机控制保护器


CD4系列电动机控制保护器

## 控制和保护电器


CB1系列控制和保护开关电器(CPS)

## 光伏发电用产品


CW3G系列隔离开关（AC，DC）


CW3DC系列直流万能式断路器


CM3DC系列直流塑壳断路器

## 小型断路器


CH系列小型断路器

## 电力质量和系统自动化器件


AD128系列信号灯
LA168系列按钮


CI1系列远程智能I/O模块


CN1DP-MP
CN1DP-MD
CN1DP-MC
通信适配器
CN1EG以太网适配器


FDM3
短消息通知模块



FWX1无线温度测量模块

## 智能化通信低压配电网络监控系列


Riyear-PowerNet配电监控系统


CEPA3智能配电一体机

# 优秀特色

### 最小化，通用化

CW3V系列真空万能式断路器与CW3系列万能式断路器抽屉座、多功能的智能控制器及附件通用，真空灭弧室内藏于基座之中，体积小，性能优

### 真空化，免维护

由于主电路开断采用密封的真空灭弧室，在开断电流时无需考虑飞弧，并且真空灭弧室无需保养

### 高分断，应用广

真空中容易灭弧的优势，不但使CW3V断路器可灵活应用于直 至AC1140V的TN、TT、IT配电系统，并使分断能力达到80kA/AC400、690V，50kA/AC1140V，产品国际领先

### 长寿命，更安全

可靠的操作机构，优异的灭弧性能，使CW3V系列断路器电气寿命达15000次，16次AC400V、690V 80kA短路电流开断；内置于基座之中的真空灭弧室，满足GB14048.2标准要求隔离功能和可选相间隔板使用户使用更安全

### 智能化，多功能

CW3V系列断路器控制器有五大类：EN-LED显示和电流、电压、电能、频率、功率测量；EA-LCD显示和电流测量；EP-LCD显示和功率测量；EQ-LCD显示和功率测量、电力质量分析；EG-LCD显示和发电机保护。电流参数有效值测量、精度高，测量精度可至电压 ± 0.5%、电流 ± 1.5%、功率 ± 2.5%。CW3V系列断路器还可以监测内部温度、内部附件、本体抽屉座运行状态

### 可通信，网络化

可选Modbus、Profibus、Devicenet、CAN任一协议直接通信输出，方便用户；并可通过本公司的CN1EG以太网适配器联接以太网网络

# 目 录

## CONTENTS

# 概　述 GENERAL

常熟开关制造有限公司经过多年的潜心研究在CW3系列万能式断路器基础上开发出以真空为灭弧介质的CW3V系列真空万能式断路器（以下简称断路器）。CW3V真空断路器秉承了CW3断路器保护功能全、测量参数多、维护功能丰富等优点，但具有更高的电气机械寿命、更多的额定短路分断次数，更强的灭弧能力，并能实现真正意义上的零飞弧，特别适用于环境相对恶劣的场所及AC690V、1140V电源TN、TT、IT系统。断路器不但可实现对线路的保护，还可实现对电动机（断路器满足GB50055对电动机保护要求）、发电机（断路器满足GB755对发电机保护要求）等设备的保护，为用户提供更安全、更可靠、更全面的低压配电保护方案。

- 断路器额定工作电压 AC50Hz/60Hz, 400V、690V、1140V
- 断路器额定电流400A ~ 3200A
- 使用类别为B
- 断路器具有抽屉式和固定式
- 断路器可倒进线连接
- 断路器具有隔离功能，符号为 
- 断路器符合以下标准：

IEC60947-1及GB/T14048.1-2012 低压开关设备和控制设备 总则

IEC60947-2及GB/T14048.2-2008 低压开关设备和控制设备 断路器

IEC60947-4-1及GB/T14048.4 低压开关设备和控制设备 机电式接触器和电动机起动器

- 断路器获国家强制性产品认证CCC标志。

Changshu Switchgear Manufacturing Co., LTD (Former changshu switchgear plant)has developed CW3V series vacuum circuit-breakers whose arcover medium is vacuum(here after simply referred to on circuit breakers)based on CW3 series air ciruit-breakers whose arc-over medium is air.CW3V vacuum circuit-breakers are in accordance with CW3 air circuit-breakers and have such advantages as fine protection function、 great amount of measurement parameters and lots of maintenance functions.still circuit breakers have longer electromechanical life,more rated short-circuit breaking times,stronger arc-over capacity and they can achieve real zero arc, especially suitable for sites with serious environment and AC690V、1140V power no-grounding IT system. Circuit breakers can be used in various low-voltage distribution areas, they can not only achieve the protection of the circuits but also realize the protection of the motors (circuit breakers meet the requirements for motor protection according to GB50055) and the generators (circuit breakers meet the requirements for generator protection according to GB755), thus they provide users with more security, more reliable and more comprehensive programs to protect low-voltage distribution.

- The circuit breakers ' rated operational voltage: AC50Hz/60Hz,400V、690V、1140V
- The circuit breakers' rated current: 400 ~ 3200A.
- Utilization category is B
- The circuit breakers have draw-out or fixed type.
- The circuit breakers can be mounted in the adverse direction.
- The circuit breakers have isolation function and the symbol are shown as 
- The circuit breakers comply with the demands of the following standards:

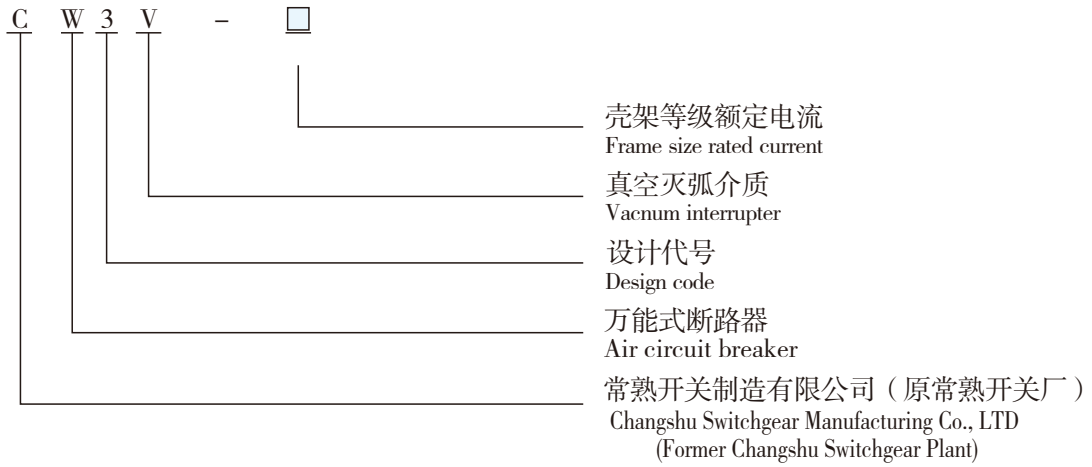
IEC60947-1 and GB/T14048.1-2012 Low-voltage switchgear and controlgear General rules

IEC60947-2 and GB/T14048.2-2008 Low-voltage switchgear and controlgear Circuit-breakers

IEC60947-4-1 and GB/T14048.4 Low-voltage switchgear and controlgear Electro-mechanical contactor and motor starter.

- The circuit breakers have obtained the CCC mark of CQC.

## 型号含义 TYPE DESIGNATION AND ITS MEANING




## 正常使用条件和安装条件 NORMAL SERVICE AND MOUNTING CONDITIONS

- 周围空气温度-5℃～+40℃；
- 安装地点的海拔不超过2000m；
- 空气的相对湿度在最高温度为+40℃时不超过50%，在较低温度下可以允许有较高的相对湿度，例如20℃时达90%，对由于温度变化偶尔产生的凝露应采取特殊的措施；
- 污染等级为3级；
- 断路器主电路的安装类别为Ⅳ，其余辅助电路、控制电路安装类别为Ⅲ；
- 断路器适用于电磁环境A；
- 湿热带型（TH型）断路器通过GB/T2423.4、GB/T2423.18试验要求，能耐受潮湿空气、盐雾、油雾、霉菌的影响；
- 断路器安装的垂直倾斜度不超过5°；
- 断路器应安装在无爆炸危险和无导电尘埃、无足以腐蚀金属和破坏绝缘的地方；
- 断路器安装在柜体小室内，且加装门框，防护等级达IP40。
- 可运行条件：

断路器通过GB/T 2423.1和GB/T2423.2的试验要求，周围空气温度可低至-25℃（配EN型智能控制器可至-40℃）、高至+70℃（超过+40℃降容使用，详见本样本中的断路器功耗及降容系数）；

断路器通过GB/T2423.4试验Db（温度+55℃、相对湿度95%）要求；

海拔超过2000m降容使用，详见本样本中的高海拔降容；

- 储存条件：周围空气温度为-25℃～+70℃。

- Ambient temperature: -5℃～+40℃；
- Altitude ≤2000m
- Relative humidity: not exceed 50% at the maximum ambient temperature of +40℃, but higher relative humidity at the lower temperature, for example, 90% at 20℃. Special measures should be taken considering the dews on product surface due to temperature change;
- Pollution protection: 3 grade;
- Installing categories: IV for the main circuit; III for other auxiliary and control circuits;
- The breaker is suitable in electromagnetic environment A;
- Damp heat type (TH) breakers are tested by GB/T2423.4、GB/T2423.18,can bear the influence of moisture in the air of salt fog and oil fog or mould.
- The vertical gradient isn't more than 5°;
- There must be not any explosive medium, and there must be not any gas which would corrode metal or any conducting dust which would destory the insulation;
- The circuit breaker should be installed in the compartment of switchgear cabinet and doorframe should be fixed additionally. Protection grade up to Ip40.
- Sevice condition:

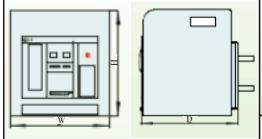
The breakers are tested by GB/T 2423.1 and GB/T2423.2,ambient temperature lower -25℃ (-40℃ for EN intelligent controller)、higher +70℃ (temperature over +40℃,the breakers are used by reducing capacity;please seeing "power consumption and capacity lowering coefficient");

The breakers are tested by GB/T2423.4 test Db (temperature +55℃, relative humidity 95%);

Elevation over 2000m,the breakers are used by reducing capacity,please seeing "capacity-reducing for high-elevation".

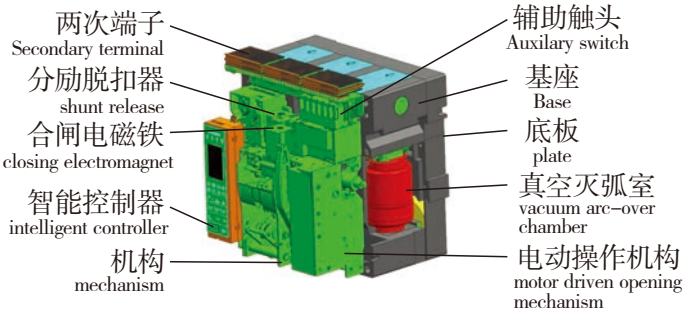
- Storage condiction:ambient temperature -25℃~+70℃.

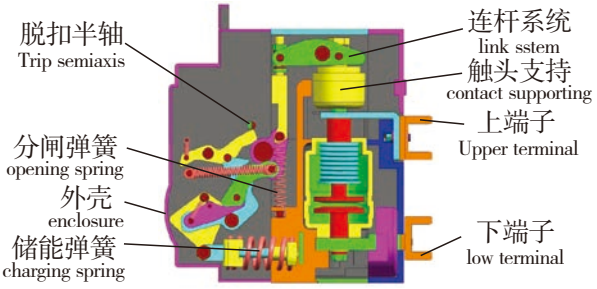
# 主要技术指标 MAIN TECHNICAL INDEX

| 型 号 Type designation | | | | CW3V-2000 | CW3V-3200 |
|---|---|---|---|---|---|
| 壳架等级额定电流Inm(A) Frame size rated current | | | | 2000 | 3200 |
| 额定电流In(A) Rated current | | | | 400/630/800/1000/1250/1600/2000 | 630/800/1000/1250/1600/2000/2500/2900/3200 |
| 额定工作电压Ue(V) Rated operational voltage | | | | AC50Hz/60Hz, 400、690、1140 | |
| 额定绝缘电压Ui(V) Rated insulation voltage | | | | 1250 | |
| 额定冲击耐受电压Uimp(kV) Rated impulse withstand voltage | | | | 12 | |
| 工频耐受电压U(V) Power-frequency withstand voltage | | | | 3500 | |
| 极数 Pole number | | | | 3 | |
| 额定极限短路分断能力Icu(kA)（有效值）* Rated ultimate short-circuit breaking capacity(r.m.s value) | AC400V | | | 65 | 80 |
| | AC690V | | | 65 | 80 |
| | AC1140V | | | 40 | 50 |
| 额定运行短路分断能力Ics(kA)（有效值）* Rated service short-circuit breaking capacity(r.m.s value) | AC400V | | | 65 | 80 |
| | AC690V | | | 65 | 80 |
| | AC1140V | | | 40 | 50 |
| 额定短路接通能力Icm(kA)（峰值） Rated short-circuit breaking capacity(peak value) | AC400V | | | 143 | 176 |
| | AC690V | | | 143 | 176 |
| | AC1140V | | | 84 | 105 |
| 额定短时耐受电流(1s)Icw(kA)（有效值） Rated short-time withstand curent(r.m.s value) | AC400V | | | 50 | 65 |
| | AC690V | | | 50 | 65 |
| | AC1140V | | | 40 | 50 |
| 分断时间（ms） Breaking time | | | | < 30 | |
| 闭合时间（ms） Closing time | | | | < 70 | |
| 电气寿命**（次） Electrical durability(times) | | | | 8000 | 6000 |
| 机械寿命**（次） Mechanical durability(times) | 免维护 Non-maintenance | | | 8000 | 6000 |
| | 有维护 Maintenance | | | 16000 | 10000 |
| 外形尺寸（mm） Outline dimensions  | 宽×高×深 Width × height × depth | | | W | H | D | W | H | D |
| | 抽屉式 Draw-out | 水平连接 Horizontal connected | 3P | 后置 Backset | 347 | 438 | 395 | 401 | 438 | 395 |
| | | 垂直连接 vertical connected | 3P | 后置 Backset | 347 | 438 | 395 | 401 | 438 | 395 |
| | 固定式 fixed | 水平连接 Horizontal connected | 3P | 后置 Backset | 362 | 395 | 290 | 414 | 397.5 | 290 |

*注：CW3V-2000短路开断电流AC400、690V 50kA次数不少于16次；CW3V-3200 AC400、690V 80kA短路开断16次。
*Note:the times of short-circuit breaking capacity of AC400、690V 50kA is more than sixteen.
**注：免维护寿命指电器在修理或更换部件前能完成的操作循环次数的期望值。
**Note:Non-maintenance durabilty expresses the expectancy of the number of operating cycles which can be performed by the equipment before repair or replacement parts.

## 工作原理 brief introduction of the operation

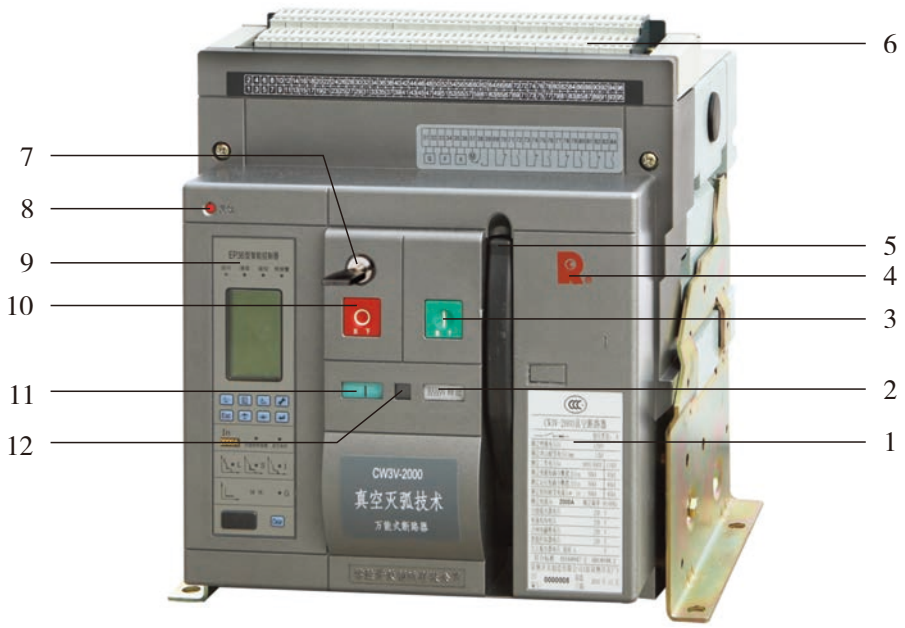



低压真空断路器由机构（自由脱扣机构）、电动操作机构、智能控制器、分励脱扣器、合闸电磁铁、连杆系统、触头支持、真空灭弧室、基座、底板和外壳等几部分组成。在合闸操作时，通过合闸电磁铁作用于机构合闸半轴，机构在储能弹簧作用下驱动连杆系统使真空灭弧室主触头闭合并将主触头锁定在闭合位置；在分闸操作或保护动作时，分励脱扣器或智能控制器作用于机构脱扣半轴，机构在分闸弹簧及触头反力作用下发生脱扣并驱动连杆系统使真空灭弧室主触头断开并保持在断开位置。由于采用了真空灭弧技术，灭弧室中不存在可被电离的物质。当开断电流触头分离时，在密闭真空管中形成金属蒸气放电弧柱，并一直维持到下一个电流过零点。在接近电流过零点时，导电的金属蒸气在几个毫秒内凝结在触头的金属表面，触头间隙的介质强度迅速恢复，金属蒸气弧柱在电流自然过零时刻瞬间熄灭，完成了开断过程。另外，自由脱扣机构的采用，使断路器在合闸过程中的任何时刻，若智能控制器动作，断路器都能可靠地断开，从而确保了安全。

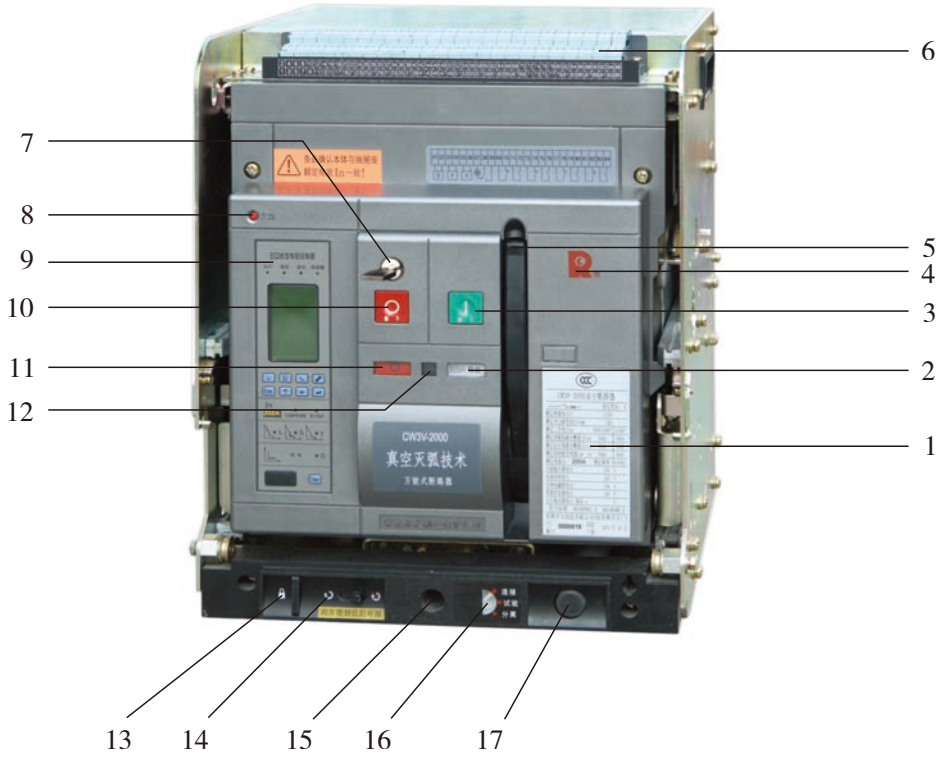
Low vacuum breaker consists of mechanism(free tripping mechamism),motor driven operating mechanism,intelligent controller,shunt retease,switch-on electromagnet,link system,contact supporting,vacuum arc-over chamber,base,plate,case and so cn.When switching on,by switch-on electromagnet operating on mechanism switch-on semi-axis,on the effect on spring the mechanism drives the link system to close the vacuum ovre-over chmber'smain contact and lodes the main contact on the closing positions When switching off or operating protection,shunt release or intelligent contoroller operates on mechanism tripping semi-axis,by the counter-force of switch-off spring and contact the mechanism trips and drives the link system to break the vacuum arc-over chamber's main contact and keeps it on the open positian.Because adopting vacuum arc-over technlilgy,When madcing or breaking the short current,there will have metal steam arc columm dischearge due to the current,the current flows the metal steam plasma body wntil the next current over zero,near the current higher them zero,the conductive metal steam condenses on the metal syrface of the contact in several millisecond,the dielectric strength in the contcut's clearance recovers immediately,the metal steam arc column extincts instanously befare the current higher them zero,the switching procedure is over.Otherwise,the adoption of tree trpping mechanism enables the breaker breaking at amy time in the switch-on procedure if the intelligent controller operates,then ensure the satty.

## 外部结构 External structure




1 铭牌
2 贮能释能指示
3 合闸按钮
4 商标
5 手动贮能手柄
6 二次回路接线端子
7 断路器“分闸”锁定装置
8 脱扣指示和复位按钮
9 智能控制器
10 分闸按钮
11 合闸“I”、分闸“O”指示
12 合闸准备就绪时指示“OK”
13 抽屉式断路器“分离”位置安全挂锁装置
14 抽屉式断路器“分离”、“试验”、“连接”三位置“解锁拨钮”
15 抽屉式断路器摇杆工作孔
16 抽屉式断路器“分离”、“试验”、“连接”三位置指示
17 抽屉式断路器摇杆存放孔

1 Nameplate
2 Indications of charging and discharging
3 Closing button
4 Brand
5 Manual charging handle
6 Terminals of secondary circuit
7 “opening” lock mechanism
8 Trip indication and resetting button
9 Intelligent controller
10 Opening button
11 Indication of closing (“I”) and opening (“O”)
12 Indication of ready-for-close (“OK”)
13 Safety padlock mechanism as the draw-out circuit breaker indicates the position of “separated”
14 "Unlock button" of the three positions ("separated", "test" and "connected") for draw-out circuit breaker
15 Rocker operating hole of the draw-out circuit breaker
16 Indications of the three positions ("separated", "test" and "connected") of the draw-out circuit breaker
17 Rocker storage hole of the draw-out circuit breaker




注：

1“分离”：指示主回路与二次回路均为隔离状态；

“试验”：指示主回路为隔离状态，二次回路为连接状态；

“连接”：指示主回路与二次回路均为连接状态。

2 当断路器本体被摇至“分离”或“试验”或“连接”位置时即可被自动锁定（摇杆不可再摇动），可通过向左拨动“解锁拨钮”解锁。

Note:

1 "Separated": indicates that main circuit and secondary circuit are both in isolation.

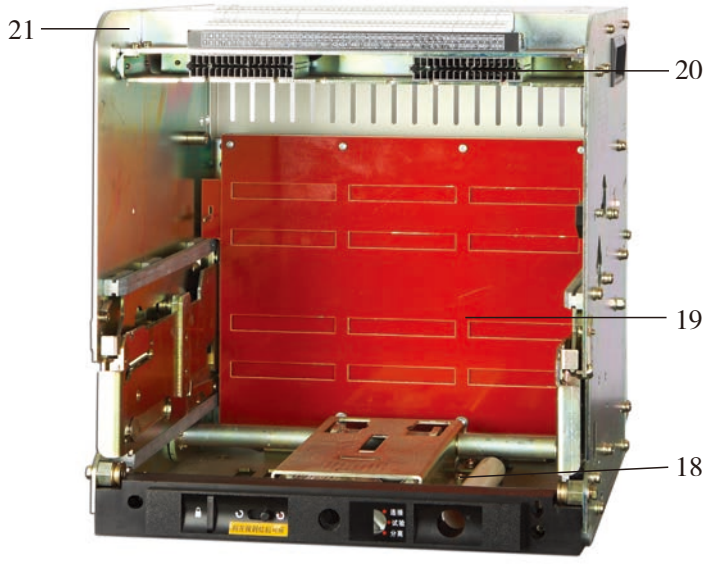
"Test": indicates that main circuit is in isolation and secondary circuit is in connection.

"Connected": indicates that main circuit and secondary circuit are both in connection.

2 The circuit breaker can be automatically locked (rocker can not be turned at this point) when its main part is at the position of "separated", "test" or "connected" by turning the rocker, and can be unlocked by pushing "unlock button" to the left side.

- 抽屉式断路器的抽屉座
- Draw-out socket of draw-out circuit breaker

抽屉式断路器的抽屉座具有隔离主回路母排的挡板，当断路器抽出时起安全保护作用。
The draw-out socket has the hack plate for isolating the copper bar of the main circuit, which takes the role of safety protection when the circuit breaker is draw out.




| | | |
|---|---|---|
| 18 | 安装孔 | 18 Installation hole |
| 19 | 安全挡板 | 19 Safety back plat |
| 20 | 二次回路接线端子 | 20 Wiring terminals of secondary circuit |
| 21 | 侧板 | 21 Side plate |

## （一）智能控制器类型
## （一）Selecting the intelligent controller

| EA35型<br>Type EA35 | EA36型<br>Type EA36 | EP35型<br>Type EP35 | EP36型<br>Type EP36 | EQ35型<br>Type EQ35 |
|---|---|---|---|---|
| LCD显示，参数连续设定，具有电流测量功能 | LCD显示，参数连续设定，具有电流测量功能 | LCD显示，参数连续设定，具有EA的所有功能且另具有电压、功率、频率、电能、相序、需用值测量功能及附加保护 | LCD显示，参数连续设定，具有EA的所有功能且另具有电压、功率、频率、电能、相序、需用值测量功能及附加保护 | LCD显示，参数连续设定，具有EP的所有功能且另具有谐波分析和波形捕捉功能 |
| With such performances as LCD infication,consecutive parameter-setting and measurement function of current | with such performances as LCD indication, consecutive parameter-setting and measurement function of current. | with such performances as LCD indication and consecutive parameter-setting, adds measurement function of voltage, power, frequency, energy, phase sequence and demand value and attached protection except the functions of EA. | with such performances as LCD indication and consecutive parameter-setting, adds measurement function of voltage, power, frequency, energy, phase sequence and demand value and attached protection except the functions of EA. | with such performances as LCD indication and consecutive parameter-setting, adds harmonic analysis function and harmonic capture function except the functions of EP. |
| 过载长延时+短路短延时+短路瞬时 | 过载长延时+短路短延时+短路瞬时+接地故障 | 过载长延时+短路短延时+短路瞬时 | 过载长延时+短路短延时+短路瞬时+接地故障 | 过载长延时+短路短延时+短路瞬时 |
| Overload long-time delay & short-circuit short-time delay & instantaneous short-circuit | Overload long-time delay & short-circuit short-time delay & instantaneous short-circuit & earth-fault protection | Overload long-time delay & short-circuit short-time delay & instantaneous short-circuit | Overload long-time delay & short-circuit short-time delay & instantaneous short-circuit & earth-fault protection | Overload long-time delay & short-circuit short-time delay & instantaneous short-circuit |

| EQ36型<br>Type EQ36 | EG35型，发电机保护型<br>Type EG35 which is the generator protection type | EG36型，发电机保护型<br>Type EG36 which is the generator protection type | EN35型<br>Type EN35 | EN36型<br>Type EN36 |
|---|---|---|---|---|
| LCD显示，参数连续设定，具有EP的所有功能且另具有谐波分析和波形捕捉功能 | LCD显示，参数连续设定，具有EQ的所有功能，且另具有过频、欠频、逆功率保护功能 | LCD显示，参数连续设定，具有EQ的所有功能，且另具有过频、欠频、逆功率保护功能 | LED显示，参数连续设定，具有电流、电压、电能、频率、功率测量功能 | LED显示，参数连续设定，具有电流、电压、电能、频率、功率测量功能 |
| with such performances as LCD indication and consecutive parameter-setting, adds harmonic analysis function and harmonic capture function except the functions of EP. | with such performances as LCD indication and consecutive parameter-setting, adds protection of over-frequency, under-frequency and inverse power except the functions of EQ. | with such performances as LCD indication and consecutive parameter-setting, adds protection of over-frequency, under-frequency and inverse power except the functions of EQ. | With such perfo-rmances as LED indication,consecuti ve parameter-setting and measurement function of current,voltage,ener gy,frequency and power | With such perfo-rmances as LED indication,consecuti ve parameter-setting and measurement function of current,voltage,ener gy,frequency and power |
| 过载长延时＋短路短延时＋短路瞬时＋接地故障 | 过载长延时＋短路短延时＋短路瞬时 | 过载长延时＋短路短延时＋短路瞬时＋接地故障 | 过载长延时+短路短延时+短路瞬时 | 过载长延时+短路短延时+短路瞬时+接地故障 |
| Overload long-time delay & short-circuit short-time delay & instantaneous short-circuit & earth-fault protection | Overload long-time delay & short-circuit short-time delay & instantaneous short-circuit | Overload long-time delay & short-circuit short-time delay & instantaneous short-circuit & earth-fault protection | Overload long-time delay & short-circuit short-time delay & instantaneous short-circuit | Overload long-time delay & short-circuit short-time delay & instantaneous short-circuit & earth-fault protection |





## （二）智能控制器功能 （二）Functions of intelligent controller

一般配电回路用智能控制器EN、EA、EP、EQ的功能（√表示基本功能；○表示选择功能；—表示无此功能）

Functions of type EN、EA, EP and EQ intelligent controllers used in general distribution circuits (√ represents fundamental functions; ○ represents selective functions; – represents no such functions)

| 特性项目 Characteristic project | | | 智能控制器Intelligent controller | | | |
|---|---|---|---|---|---|---|
| | | | EA | EP | EQ | EN |
| 保护/报警 Protection/alarm | 过载长延时保护（热模拟10分钟）Overload long-time delay protection (Thermal memory for 10min) | | √ | √ | √ | √ |
| | 短路短延时保护（热模拟5分钟）Short-circuit short-time delay protection (thermal memory for 5min) | | √ | √ | √ | √ |
| | 短路瞬时保护 Instantaneous short-circuit protection | | √ | √ | √ | √ |
| | 接地故障保护（二选一）Earth-fault protection (choose one of the two) | 矢量和接地故障保护 Vector and earth-fault protection | ○ | ○ | ○ | ○ |
| | | 变压器中心点接地故障保护 Earth-fault protection of the center of transformer | ○ | ○ | ○ | ○ |
| | 中性极保护 Neutral protection | | √ | √ | √ | √ |
| | 过载预报警 Overload pre-alarm | | ○ | ○ | ○ | ○ |
| | 电流不平衡保护 Current-unbalance protection | | ○ | ○ | ○ | ○ |
| | 断相保护 Open-phase protection | | ○ | ○ | ○ | ○ |
| | 需用电流保护 Demand current protection | | — | ○ | ○ | — |
| | 过电压保护 Over-voltage protection | | — | ○ | ○ | — |
| | 低电压保护 Under-voltage protection | | — | ○ | ○ | — |
| | 电压不平衡保护 Voltage-unbalance protection | | — | ○ | ○ | — |
| | 相序保护 Phase sequence protection | | — | ○ | ○ | — |
| | 电流卸载（可设置2路） Current shedding (by two ways) | | ○ | ○ | ○ | ○ |
| | 区域选择性连锁（ZSI） Zone selective interlocking | | ○ | ○ | ○ | ○ |
| | MCR功能 MCR function | | √ | √ | √ | √ |
| 测量 Measurement | 电流：三相电流、中性极电流、接地电流 Current: three-phase current, neutral current, earth current | | √ | √ | √ | √ |
| | 电压：线电压、相电压、平均电压、电压不平衡度 Voltage: line voltage, phase voltage, average voltage, voltage-unbalance | | — | √ | √ | ○注2 Note2 |
| | 功率：有功功率、无功功率、视在功率、功率因数 Power: active power, reactive power, apparent power, power factor | | — | √ | √ | ○注3 Note3 |
| | 频率 Frequency | | — | √ | √ | ○ |
| | 电能：有功电能、无功电能、视在电能 Energy: active energy, reactive energy, apparent energy | | — | √ | √ | ○ |
| | 谐波 Harmonic | | — | — | √ | — |
| | 波形捕捉 Waveform capture | | — | — | √ | — |
| | 相序 Phase sequence | | — | √ | √ | — |
| | 需用值：需用电流、需用功率 Demand value: demand current, demand power | | — | √ | √ | — |
| 维护功能 Maintenance function | 断路器维护 Breaker maintenance | 触头磨损指示 Contact wearing indication | √ | √ | √ | √ |
| | | 智能控制器有电时操作次数 Operation times of intelligent controller on electricity | √ | √ | √ | √注4 Note4 |
| | | 自诊断功能（存储器故障、处理器超温）Self-diagnosis function (memory fault or processor over-temperature) | √ | √ | √ | √ |
| | | 附件监测（分励、合闸电磁铁、欠压、电机断线）Accessories monitoring (Shunt release, closing electromagnet, under-voltage release and motor disconnected) | ○ | ○ | ○ | ○ |
| | 历史记录 History | 历史最大电流（控制器显示）Maximum current (controller indication) | √ | √ | √ | — |
| | | 需用电流最大值（控制器显示）Maximum demand current value (controller indication) | — | √ | √ | — |
| | | 脱扣记录（10次）（控制器显示）Trip records (10) (controller indication) | √注1 Note1 | √ | √ | √注1 Note1 |
| | | 报警记录（10次）（控制器显示）Alarm records (10) (controller indication) | — | √ | √ | — |
| | | 历史最大、最小电流（通信输出）Maximum and minimum current (communication output) | √ | √ | √ | √ |
| | | 历史最大、最小电压（通信输出）Maximum and minimum voltage (communication output) | — | √ | √ | — |
| | | 峰值需用功率（通信输出）Demand power of peak (communication output) | — | √ | √ | — |
| | | 功率因数最大、最小值（通信输出）Maximum and minimum power factor (communication output) | — | √ | √ | — |
| | | 频率最大、最小值（通信输出）Maximum and minimum frequency (communication output) | — | √ | √ | — |
| | | 故障录波（通信输出），记录12个周波 Recording wave when error (communication output) (12 cycles) | — | — | √ | — |
| 其他 Other | 通信功能 Communication function | | ○ | ○ | ○ | ○ |

注：与电压相关的测量或保护，须提供电压输入（见本样本接线图）。Note: Voltage input must be provided for voltage-related measurement or protection.

注1）：EA、EN型智能控制器脱扣记录为1次。Note1: Release record for type EA intelligent controller is 1.

注2）：EN智能控制器无电压不平衡度测量。Note2: Without voltage-unbalance for EN controller.

注3）：EN智能控制器无功率因数测量。Note3: Without power factor for EN controller.

注4）：EN智能控制器为通信输出。Note4: Communicative output for EN controller.

用于发电机保护智能控制器EG的功能（√表示基本功能；○表示选择功能）
Functions of type EG intelligent controllers used in generator protection(√ represents fundamental functions; ○ represents selective functions; represents no such functions)

| 特性项目 Characteristic project | | | 智能控制器 Intelligent controller |
|---|---|---|---|
| | | | EG |
| 保护/报警 Protection/ alarm | 过载长延时保护（热模拟10分钟） Overload long-time delay protection (Thermal memory for 10min) | | √ |
| | 短路短延时保护（热模拟5分钟） Short-circuit short-time delay protection (Thermal memory for 5min) | | √ |
| | 短路瞬时保护 Instantaneous short-circuit protection | | √ |
| | 接地故障保护（矢量和接地故障保护） Earth-fault protection (Vector and earth-fault protection) | | ○ |
| | 中性极保护 Neutral protection | | √ |
| | 过载预报警 Overload pre-alarm | | ○ |
| | 电流不平衡保护 Current-unbalance protection | | ○ |
| | 断相保护 Open-phase protection | | ○ |
| | 需用电流保护 Demand current protection | | ○ |
| | 过电压保护 Over-voltage protection | | ○ |
| | 低电压保护 Under-voltage protection | | ○ |
| | 电压不平衡保护 Voltage-unbalance protection | | ○ |
| | 过频保护 Over-frequency protection | | √ |
| | 欠频保护 Under-frequency protection | | √ |
| | 相序保护 Phase sequence protection | | ○ |
| | 逆功率保护 Inverse power protection | | √ |
| | 电流卸载（可设置2路） Current shedding (by two ways) | | ○ |
| | 区域选择性连锁（ZSI） Zone selective interlocking | | ○ |
| | MCR功能 MCR function | | √ |
| 测量 Measurement | 电流：三相电流、中性极电流、接地电流 Current: three-phase current, neutral current, earth current | | √ |
| | 电压：线电压、相电压、平均电压、电压不平衡度 Voltage: line voltage, phase voltage, average voltage, voltage-unbalance | | √ |
| | 功率：有功功率、无功功率、视在功率、功率因数 Power: active power, reactive power, apparent power, power factor | | √ |
| | 频率 Frequency | | √ |
| | 电能：有功电能、无功电能、视在电能 Energy: active energy, reactive energy, apparent energy | | √ |
| | 谐波 Harmonic | | √ |
| | 波形捕捉 Waveform capture | | √ |
| | 相序 Phase sequence | | √ |
| | 需用值：需用电流、需用功率 Demand value: demand current, demand power | | √ |
| 维护功能 Maintenance function | 断路器维护功能 Breaker maintenance | 触头磨损指示 Contact wearing indication | √ |
| | | 智能型控制器有电时操作次数 Operation times of intelligent controller on electricity | √ |
| | | 自诊断功能（存储器故障、处理器超温） Self-diagnosis function (memory fault or processor over-temperature) | √ |
| | | 附件监测（分励、合闸电磁铁、欠压、电机断线） Accessories monitoring (Shunt release, closing electromagnet, under-voltage release and motor disconnected) | ○ |
| | 历史记录 History | 历史最大电流（控制器显示） Maximum current (controller indication) | √ |
| | | 需用电流最大值（控制器显示） Maximum demand current value (controller indication) | √ |
| | | 脱扣记录（10次）（控制器显示） Trip records (10) (controller indication) | √ |
| | | 报警记录（10次）（控制器显示） Alarm records (10) (controller indication) | √ |
| | | 历史最大、最小电流（通信输出） Maximum and minimum current (communication output) | √ |
| | | 历史最大、最小电压（通信输出） Maximum and minimum voltage (communication output) | √ |
| | | 峰值需用功率（通信输出） Demand power of peak (communication output) | √ |
| | | 功率因数最大、最小值（通信输出） Maximum and minimum power factor (communication output) | √ |
| | | 频率最大、最小值（通信输出） Maximum and minimum frequency (communication output) | √ |
| | | 故障录波（通信输出），记录12个周波 Recording wave when error (communication output) (12 cycles) | √ |
| 其他 Other | 通信功能 Communication function | | ○ |

注：与电压相关的测量或保护，须提供电压输入（见本样本接线图）。
Note: Voltage input must be provided for voltage-related measurement or protection.

## （三）智能控制器的保护特性及相关曲线
## （三）Protection characteristics and related curves of intelligent controller

### 一般配电回路用智能控制器EN、EA、EP、EQ保护功能及设定值
Protection and settings of type EN，EA, EP, and EQ intelligent controllers used in general distribution circuits.

| 保护功能 Protection | 动作值 Operating value | 动作延时 Operating delay | 可否关闭 Can off or not | 热模拟 Thermal memory | ZSI |
|---|---|---|---|---|---|
| ■ 过载长延时保护 Overload long-time delay | $I_{r1}$=(0.4~1)In | $I^2t$： | – | ■ | |

| 1.05$I_{r1}$ | 2h内不动作 | | | | | |
|---|---|---|---|---|---|---|
| 1.30$I_{r1}$ | 1h内动作 | | | | | |
| 1.5$I_{r1,t1}$ | 15s | 30s | 60s | 120s | 240s | 480s |
| 2.0$I_{r1}$ | 8.4s | 16.9s | 33.7s | 67.5s | 135s | 270s |
| 6.0$I_{r1}$ | 0.94s | 1.88s | 3.75s | 7.5s | 15s | 30s |
| 7.2$I_{r1}$ | 0.65s | 1.30s | 2.60s | 5.20s | 10s | 21s |

It（IEC60255-3）：

| 1.05$I_{r1}$ | 2h内不动作 | | | | | |
|---|---|---|---|---|---|---|
| 1.30$I_{r1}$ | 1h内动作 | | | | | |
| 1.5$I_{r1,t1}$ | 10s | 15s | 30s | 60s | 90s | 120s |
| 2.0$I_{r1}$ | 5s | 7.5s | 15s | 30s | 45s | 60s |
| 6.0$I_{r1}$ | 1s | 1.5s | 3s | 6s | 9s | 12s |
| 7.2$I_{r1}$ | 0.81s | 1.21s | 2.42s | 4.84s | 7.26s | 9.68s |

I4t（IEC60255-3）：

| 1.05$I_{r1}$ | 2h内不动作 | | | | | |
|---|---|---|---|---|---|---|
| 1.30$I_{r1}$ | 1h内动作 | | | | | |
| 1.5$I_{r1,t1}$ | 60s | 120s | 240s | 480s | 960s | 1440s |
| 2.0$I_{r1}$ | 16.25s | 32.5s | 65s | 130s | 260s | 390s |
| 6.0$I_{r1}$ | * | * | 0.75s | 1.51s | 3.01s | 4.52s |
| 7.2$I_{r1}$ | * | * | * | 0.73s | 1.45s | 2.18s |

*注：按短延时整定时间$t_2$动作。
*Note：operating by short-time delay $t_2$

注：EN控制器仅有$I^2t$过载长延时特性
Note:$I^2t$ overload long-time delay characterictic for EN controller.

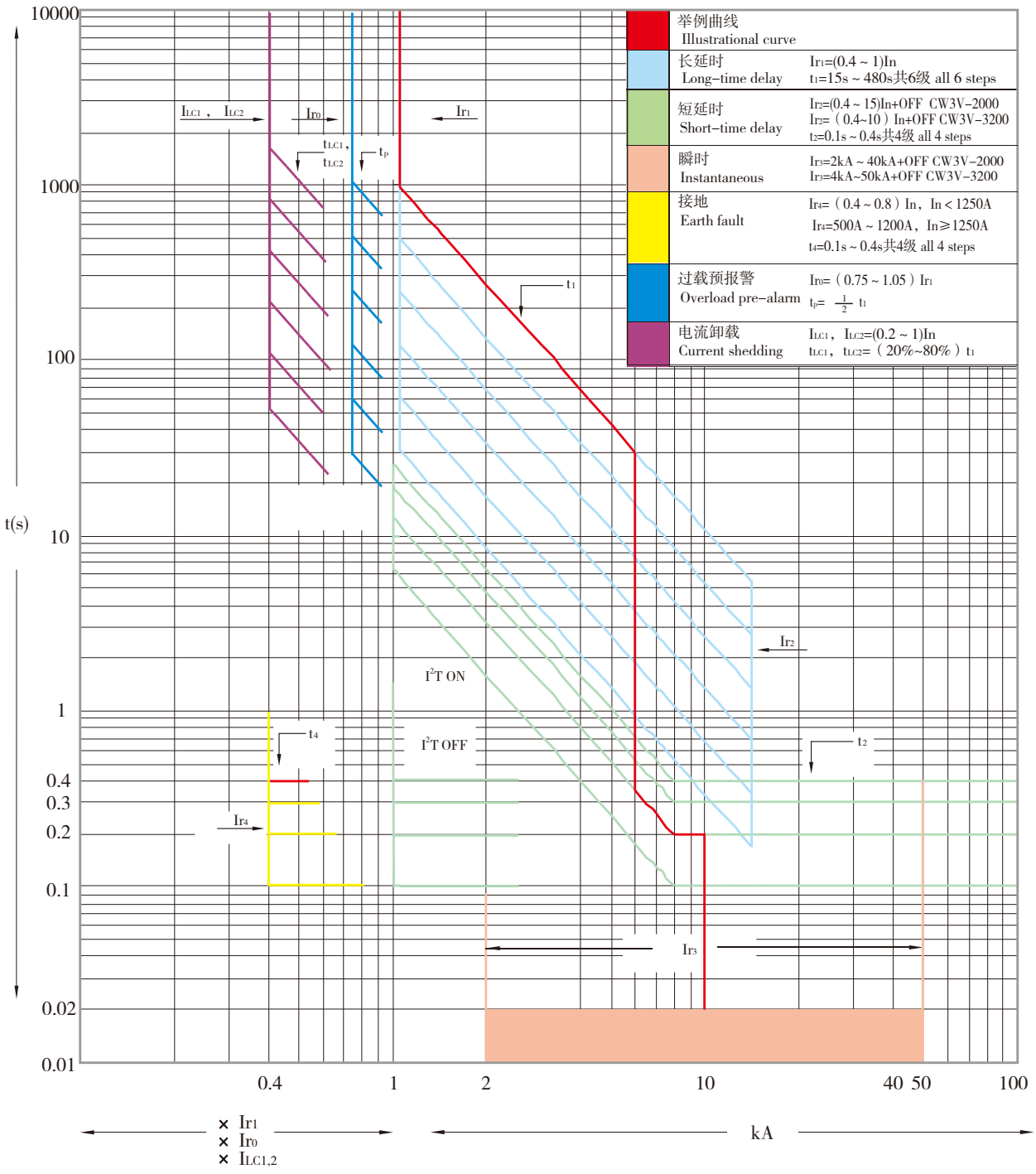
| | | | | | |
|---|---|---|---|---|---|
| 递变级差 Successive grade | 10A | | | | |
| 动作允差 Operating tolerance | | ± 10% | | | |
| ■ 短路短延时保护 Short-circuit short-time delay | Inm=2000，$I_{r2}$=(0.4~15)In<br>Inm=3200，$I_{r2}$=（0.4~10）In | 在8$I_{r1}$时(At 8$I_{r1}$)，<br>$t_2$=(0.1-0.2-0.3-0.4)s | 可OFF May OFF | ■ | ■ |
| 递变级差 Successive grade | 10A | | | | |
| 动作允差 Operating tolerance | ± 10% | ± 10%，注：固有误差最大+20ms Note: Max. inherent tolerance +20ms | | | |
| 注：$I^2t$ ON，当I≤8$I_{r1}$时，则反时限整定时间对应8Ir1；当I > 8$I_{r1}$时，则按定时限动作。$I^2t$ OFF，则按定时限动作。 | | Note: $I^2t$ ON, when I ≤8 $I_{r1}$, set time in inverse time Corresponding 8 $I_{r1}$, when I >8 Ir1, set time in definite time. $I^2t$ OFF, act in definite time. | | | |
| ■ 瞬时保护 Instantaneous | Inm=2000，$I_{r3}$=(2~40)kA<br>Inm=3200，$I_{r3}$=（4~50）kA | | 可OFF May OFF | | |
| 递变级差 Successive grade | 50A | | | | |
| 动作允差 Operating tolerance | < 3In: ± 10%<br>≥3In: ± 15% | | | | |

| 保护功能 Protection | 动作值 Operating value | 动作延时 Operating delay | 可否关闭 Can off or not | 热模拟 Thermal memory | ZSI |
|---|---|---|---|---|---|
| ■ 接地故障保护 Earth-fault | In < 1250A时，$I_{r4}$=(0.4~0.8)In | $t_4$=(0.1-0.2-0.3-0.4)s | 可OFF | | ■ |
| | In≥1250A时，$I_{r4}$=500A-1200A | | May OFF | | |
| 递变级差 Successive grade | 10A | | | | |
| 动作允差 Operating tolerance | ± 10% | ± 10%，注：固有误差最大+20ms Note: Max. inherent tolerance +20ms | | | |
| 注：接地故障保护功能OFF后，发生接地故障时，断路器不跳闸只报警。 Note: With earth-fault protection is OFF circuit breaker alarms but not trips when earth-fault happened. | | | | | |
| ■ 中性极保护 Neutral protection | 三极断路器，$I_N$=0.5N,N,2N Three-pole circuit breaker | | 可OFF May OFF | | |
| 注：需外接中性线电流互感器 Note: External neutral current transformer is required. | | | | | |
| ■ 过载预报警 Overload pre-alarm | $I_{ro}$=(0.75-1.05)$I_{r1}$ | tp=1/2$t_1$ | – | | |
| 递变级差 Successive grade | 0.05$I_{r1}$ | | | | |
| 动作允差 Operating tolerance | | ± 10% | | | |
| ■ MCR | In≤1000A时，15In<br>1000A < In < 2000A时，12In<br>In≥2000A时，10In | | | | |
| 动作允差 Operating tolerance | ± 15% | | | | |

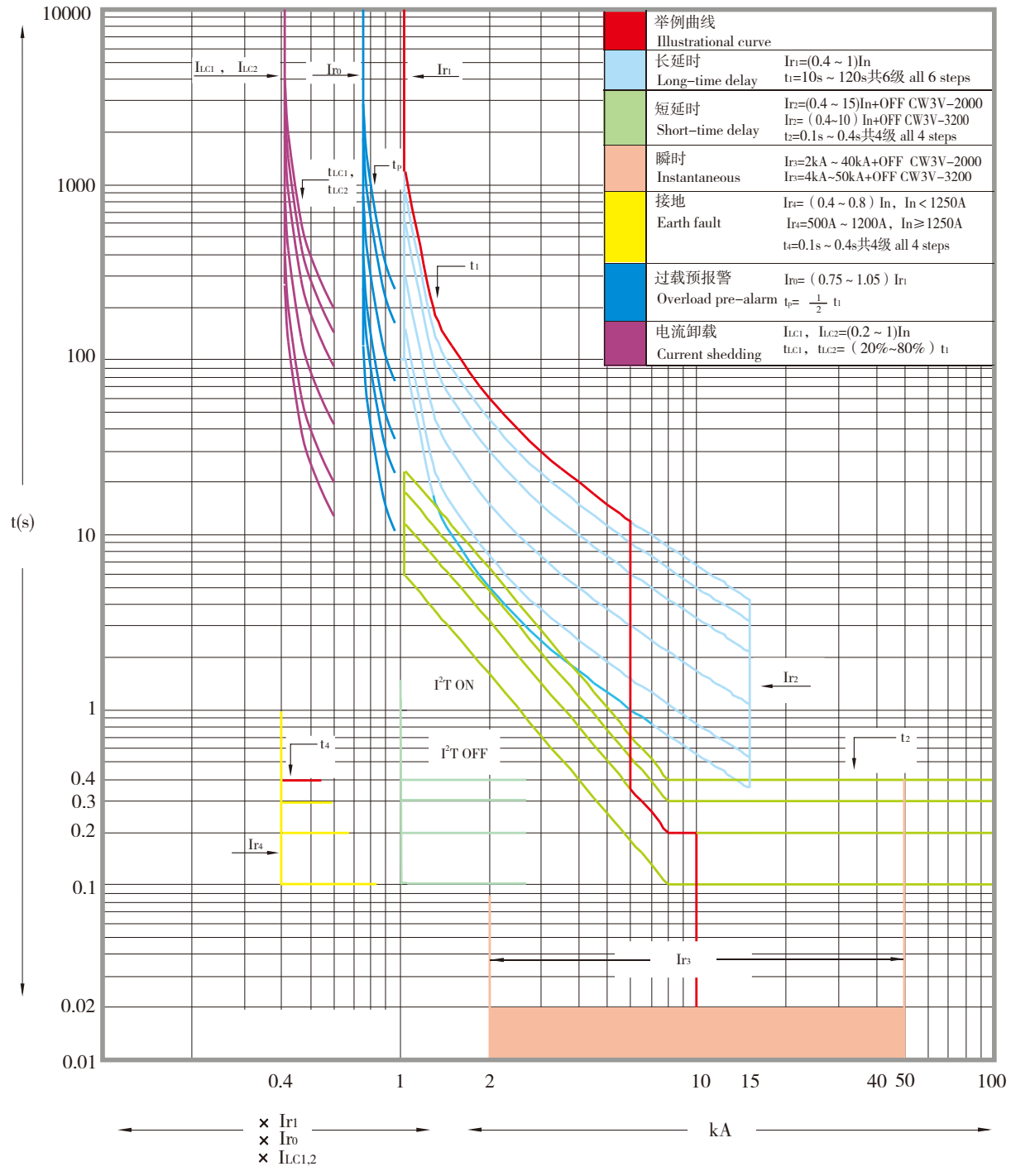
| 保护功能 Protection | 动作阈值 Operating threshold | 返回阈值 Return threshold | 动作延时 Operating delay | 返回延时 Return delay | 可否关闭 Can off or not |
|---|---|---|---|---|---|
| ■ 电流不平衡 Current unbalance protection | 20%~80% | 20%~动作阈值 20%~operating threshold | 1s~40s | 10s~360s | ■ |
| 递变级差 Successive grade | 1% | 1% | 1s | 1s | |
| 动作允差 Operating tolerance | ± 10% | ± 10% | ± 10% | ± 10% | |
| ■ 断相保护 Open-phase protection | 90%~99% | 20%~动作阈值 20%~operating threshold | 0.1s~3s | 10s~360s | ■ |
| 递变级差 Successive grade | 1% | 1% | 0.1s | 1s | |
| 动作允差 Operating tolerance | ± 10% | ± 10% | ± 10% | ± 10% | 注：固有误差最大+20ms Note: Max. inherent tolerance +20ms |
| ■ 需用电流保护 Demand current protection | 0.4In~1In | 0.4In~动作阈值 0.4In~operating threshold | 15s~1500s | 15s~3000s | ■ |
| 递变级差 Successive grade | 1A | 1A | 1s | 1s | |
| 动作允差 Operating tolerance | ± 10% | ± 10% | ± 10% | ± 10% | |
| ■ 低电压保护 Under-voltage protection | 50V~1140V | 动作阈值~969V Operating threshold~969V | 1s~30s | 1s~100s | ■ |
| 递变级差 Successive grade | 5V | 5V | 0.2s | 0.2s | |
| 动作允差 Operating tolerance | ± 5% | ± 5% | ± 5% | ± 5% | |

| 保护功能 Protection | 动作阈值 Operating threshold | 返回阈值 Return threshold | 动作延时 Operating delay | 返回延时 Return delay | 可否关闭 Can off or not |
|---|---|---|---|---|---|
| ■ 过电压保护 Over-voltage protection | 200V~1539V | 200V~动作阈值 200V~operating threshold | 1s~5s | 1s~36s | ■ |
| 递变级差 Successive grade | 5V | 5V | 0.2s | 0.2s | |
| 动作允差 Operating tolerance | ± 5% | ± 5% | ± 5% | ± 5% | |
| ■ 电压不平衡保护 Voltage unbalance protection | 2%~50% | 2%~动作阈值 2%~operating threshold | 1s~40s | 10s~360s | ■ |
| 递变级差 Successive grade | 1% | 1% | 1s | 1s | |
| 动作允差 Operating tolerance | ± 10% | ± 10% | ± 10% | ± 10% | |
| ■ 相序保护 Phase sequence protection | 1,2,3或1,3,2 | | 0.3s | | ■ |
| 动作允差 Operating tolerance | | | ± 10% | | |
| ■ 电流卸载 Current shedding | 0.2In~1In | 0.2In~动作阈值 0.2In~operating threshold | (20%~80%)$t_1$ | 10s~600s | ■ |
| 递变级差 Successive grade | 10A | 10A | 10%$t_1$ | 1s | |
| 动作允差 Operating tolerance | | | ± 10% | ± 10% | |

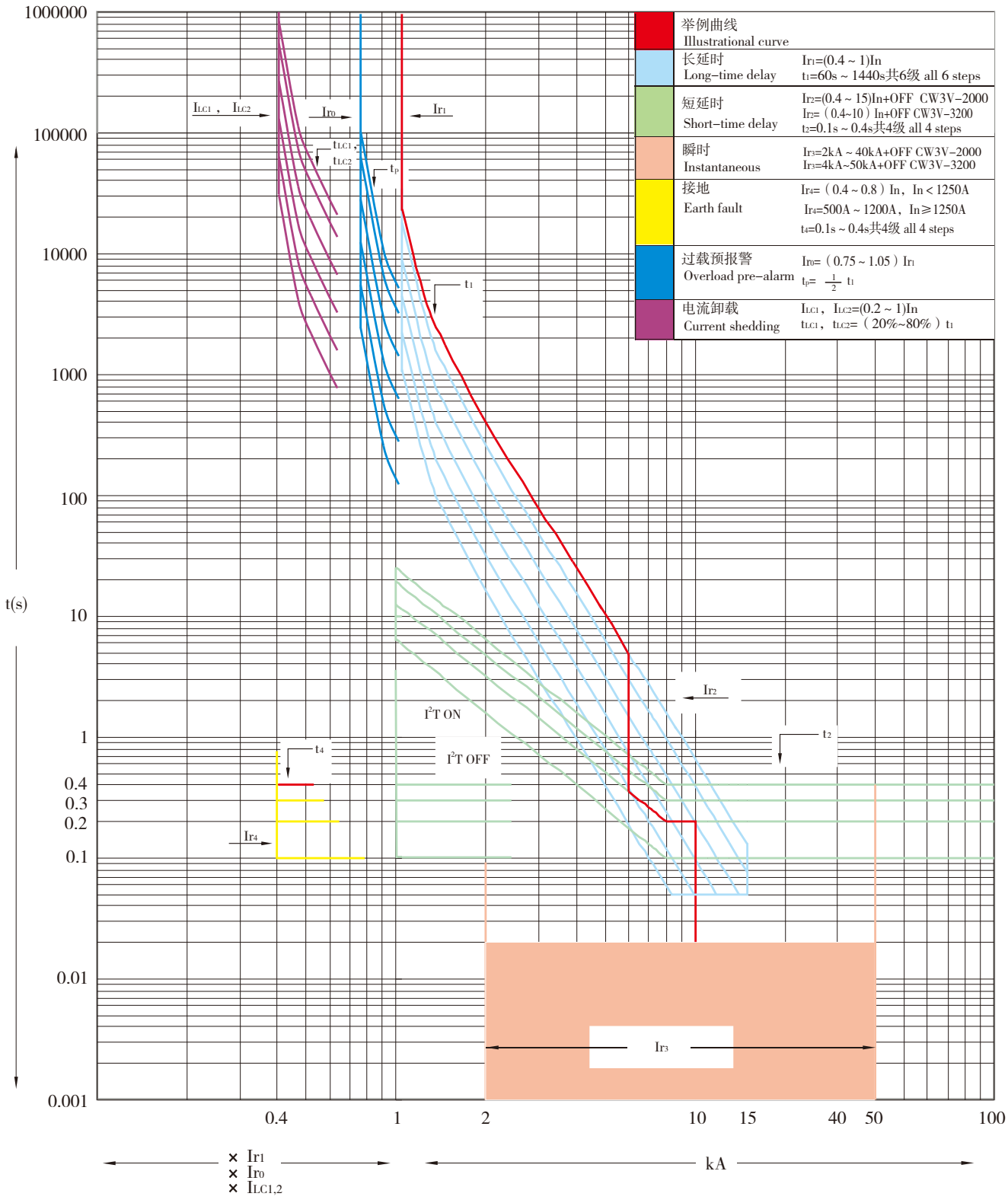
EN、EA、EP、EQ 智能控制器$I^2t$时间/电流特性曲线，CW3V–2000/3200
T/I (time/current) curve of $I^2t$ of type EN, EA, EP and EQ intelligent controllers



EA、EP、EQ 智能控制器非常反时限It时间/电流特性曲线，CW3V-2000/3200
T/I (time/current) curve of uncommon inverse time It of type EA, EP and EQ intelligent controllers



EA、EP、EQ 智能控制器高压熔丝配合$I^4t$时间/电流特性曲线，CW3V-2000/3200
T/I (time/current) curve of high-voltage fuse $I^4t$ of type EA, EP and EQ intelligent controllers



EG智能控制器的保护功能及设定值
Protection and settings of type EG intelligent controller

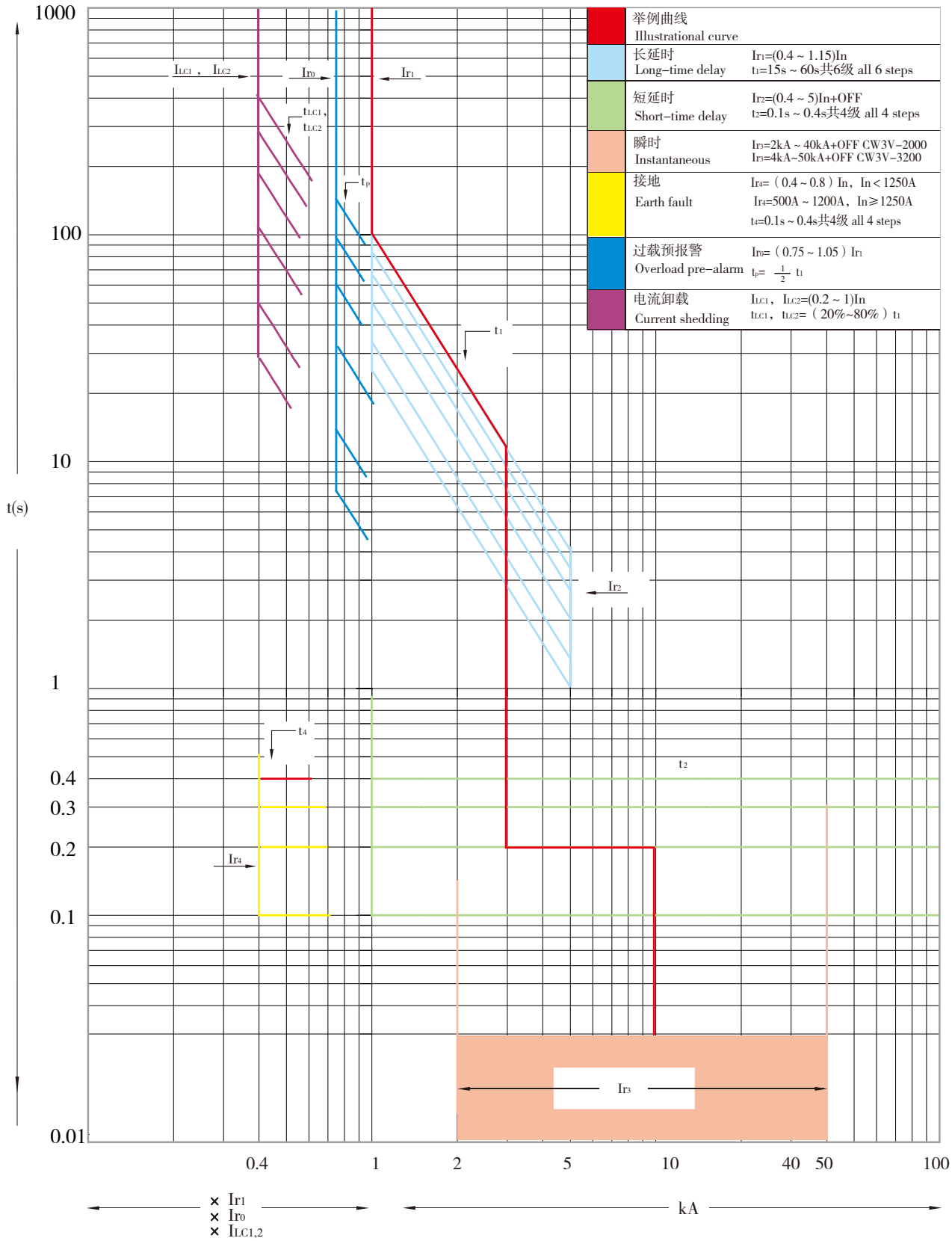
| 保护功能 Protection | 动作值 Operating value | 动作延时 Operating delay | 可否关闭 Can off or not | 热模拟 Thermal memory | ZSI |
|---|---|---|---|---|---|
| ■ 过载长延时保护 Overload long-time delay | $I_{r1}$=(0.4~1.15)In | $I^2t$: 见下表 | – | ■ | |
| 递变级差 Successive grade | 10A | | | | |
| 动作允差 Operating tolerance | | ± 10% | | | |
| ■ 短路短延时保护 Short-circuit short-time delay | $I_{r2}$=(0.4~5)In | $t_2$=(0.1–0.2–0.3–0.4)s | 可OFF May OFF | ■ | ■ |
| 递变级差 Successive grade | 10A | | | | |
| 动作允差 Operating tolerance | ± 10% | ± 10% 注：固有误差最大+20ms | | | |
| 注：动作特性为定时限 Note: Action characteristic definite. | | Note: Max. inherent tolerance +20ms | | | |
| ■ 瞬时保护 Instantaneous | Inm=2000，$I_{r3}$=(2~40)kA<br>Inm=3200，Ir3=（4~50）kA | | 可OFF May OFF | | |
| 递变级差 Successive grade | 50A | | | | |
| 动作允差 Operating tolerance | < 3In: ± 10%<br>≥3In: ± 15% | | | | |
| ■ 接地故障保护 Earth-fault | In < 1250A时，$I_{r4}$=(0.4~0.8)In<br>In≥1250A时，$I_{r4}$=500A~1200A | $t_4$=(0.1–0.2–0.3–0.4)s | 可OFF May OFF | | ■ |
| 递变级差 Successive grade | 10A | | | | |
| 动作允差 Operating tolerance | ± 10% | ± 10%，注：固有误差最大+20ms Note: Max. inherent tolerance +20ms | | | |
| 注：接地故障保护功能OFF后，发生接地故障时，断路器不跳闸只报警。 | | Note: With earth-fault protection is OFF circuit breaker alarms but not trips when earth-fault happened. | | | |
| ■ 中性极保护 Neutral protection | 三极断路器，$I_N$=0.5N,N<br>Three-pole circuit breaker.<br>注：需外接中性线电流互感器 Note: External neutral current transformer is required. | | 可OFF May OFF | | |
| ■ 过载预报警 overload pre-alarm | $I_{ro}$=(0.75–1.05)$I_{r1}$ | $t_p$=1/2$t_1$ | – | | |
| 递变级差 Successive grade | 0.05$I_{r1}$ | | | | |
| 动作允差 Operating tolerance | | ± 10% | | | |
| ■ MCR | In≤1000A时，15In<br>1000A < In < 2000A时，12In<br>In≥2000A时，10In | | | | |
| 动作允差 Operating tolerance | ± 15% | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.0$I_{r1}$ | 2h内不动作 | | | | | | |
| 1.1$I_{r1}$ | 20.95s | 27.93s | 41.9s | 55.87s | 69.83s | 83.8s | |
| 1.3$I_{r1.1}$ | 15s | 20s | 30s | 40s | 50s | 60s | |
| 2.0$I_{r1}$ | 6.34s | 8.45s | 12.68s | 16.9s | 21.13s | 25.35s | |

| 保护功能 Protection | 动作阈值 Operating threshold | 返回阈值 Return threshold | 动作延时 Operating delay | 返回延时 Return delay | 可否关闭 Can off or not |
|---|---|---|---|---|---|
| ■ 电流不平衡 Current unbalance protection | 20%~80% | 20%~动作阈值 20%~operating threshold | 1s~40s | 10s~360s | ■ |
| 递变级差 Successive grade | 1% | 1% | 1s | 1s | |
| 动作允差 Operating tolerance | ± 10% | ± 10% | ± 10% | ± 10% | |
| ■ 断相保护 Open-phase protection | 90%~99% | 20%~动作阈值 20%~operating threshold | 0.1s~3s | 10s~360s | ■ |
| 递变级差 Successive grade | 1% | 1% | 0.1s | 1s | |
| 动作允差 Operating tolerance | ± 10% | ± 10% | ± 10% | ± 10% | 注：固有误差最大+20ms Note: Max. inherent tolerance +20ms |
| ■ 需用电流保护 Demand current protection | 0.4In~1In | 0.4In~动作阈值 0.4In~operating threshold | 15s~1500s | 15s~3000s | ■ |
| 递变级差 Successive grade | 1A | 1A | 1s | 1s | |
| 动作允差 Operating tolerance | ± 10% | ± 10% | ± 10% | ± 10% | |
| ■ 低电压保护 Under-voltage protection | 50V~1140V | 动作阈值~969V Operating threshold~969V | 1s~30s | 1s~100s | ■ |
| 递变级差 Successive grade | 5V | 5V | 0.2s | 0.2s | |
| 动作允差 Operating tolerance | ± 5% | ± 5% | ± 5% | ± 5% | |
| ■ 过电压保护 Over-voltage protection | 200V~1539V | 200V~动作阈值 200V~operating threshold | 1s~5s | 1s~36s | ■ |
| 递变级差 Successive grade | 5V | 5V | 0.2s | 0.2s | |
| 动作允差 Operating tolerance | ± 5% | ± 5% | ± 5% | ± 5% | |
| ■ 电压不平衡保护 Voltage unbalance protection | 2%~50% | 2%~动作阈值 2%~operating threshold | 1s~40s | 10s~360s | ■ |
| 递变级差 Successive grade | 1% | 1% | 1s | 1s | |
| 动作允差 Operating tolerance | ± 10% | ± 10% | ± 10% | ± 10% | |

| 保护功能<br>Protection | 动作阈值<br>Operating threshold | 返回阈值<br>Return threshold | 动作延时<br>Operating delay | 返回延时<br>Return delay | 可否关闭<br>Can off or not |
|---|---|---|---|---|---|
| ■ 逆功率保护<br>Inverse power protection | 20kW~500kW | 20kW~动作阈值<br>20kW~operating threshold | 0.2s~20s | 1s~360s | ■ |
| 递变级差<br>Successive grade | 5kW | 5kW | 0.1s | 0.1s | |
| 动作允差<br>Operating tolerance | ± 5% | ± 5% | ± 10% | ± 10% | |
| ■ 过频保护<br>Over–frequency protection | 50Hz~65Hz | 45Hz~动作阈值<br>45Hz~operating threshold | 0.2s~5s | 1s~360s | ■ |
| 递变级差<br>Successive grade | 0.5Hz | 0.5Hz | 0.1s | 0.1s | |
| 动作允差<br>Operating tolerance | ± 0.5Hz | ± 0.5Hz | ± 10% | ± 10% | |
| ■ 欠频保护<br>Under–frequency protection | 45Hz~60Hz | 动作阈值~60Hz<br>Operating threshold ~ 60Hz | 0.2s~5s | 1s~360s | ■ |
| 递变级差<br>Successive grade | 0.5Hz | 0.5Hz | 0.1s | 0.1s | |
| 动作允差<br>Operating tolerance | ± 0.5Hz | ± 0.5Hz | ± 10% | ± 10% | |
| ■ 相序保护<br>Phase sequence protection | 1,2,3或1,3,2( 1, 2, 3 or 1, 3, 2) | | 0.3s | | ■ |
| 动作允差<br>Operating tolerance | | | ± 10% | | |
| ■ 电流卸载<br>Current shedding | 0.2In~1In | 0.2In~动作阈值<br>0.2In~operating threshold | (20%~80%)$t_1$ | 10s~600s | ■ |
| 递变级差<br>Successive grade | 10A | 10A | 10%$t_1$ | 1s | |
| 动作允差<br>Operating tolerance | | | ± 10% | ± 10% | |

EG 智能控制器$I^2t$时间/电流特性曲线，CW3V–2000/3200
T/I (time/current) curve of $I^2t$ of type EG intelligent controller



（四）智能控制器的显示及测量准确度
（四）Indication and accuracy of intelligent controller

| 项目 Item | | | 准确度测量范围 Measurement range of accuraey | 准确度 Accuracy | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | EN | EA | EP | EQ | EG |
| 电流测量 Current measurement | | $I_1$、$I_2$、$I_3$、$I_N$ | (0.2In ~ 1.2In)A | ± 1.5% | ± 1.5% | ± 1.5% | ± 1.5% | ± 1.5% |
| | | Ig | (0.2In ~ 2000)A | ± 2.5% | ± 2.5% | ± 2.5% | ± 2.5% | ± 2.5% |
| 电流需用值测量 Demand current measurement | | $\overline{Ia}$、$\overline{Ib}$、$\overline{Ic}$、$\overline{I_N}$ | (0.2In ~ 1.2In)A | — | — | ± 2.5% | ± 2.5% | ± 2.5% |
| 电压测量 Voltage measurement | | 线电压($U_{12}$、$U_{23}$、$U_{31}$) 及相电压 Line voltage And phase voltage（$U_{1N}$、$U_{2N}$、$U_{3N}$）、$U_{avg}$、$U_{unbal}$ | 30V~690V | ± 1% | — | ± 0.5% | ± 0.5% | ± 0.5% |
| 功率测量 Power measurement | | P<br>Q<br>S | -9999kW~+9999kW<br>-9999kvar~+9999kvar<br>-9999kVA~+9999kVA | ± 2.5% | — | — | — | — |
| | | | -120MW~+120MW<br>-120Mvar~+120Mvar<br>-120MVA~+120MVA | — | — | ± 2% | ± 2% | ± 2% |
| 功率需用值测量 Demand power measurement | | $\overline{P}$<br>$\overline{Q}$<br>S | -120MW~+120MW<br>-120Mvar~+120Mvar<br>-120MVA~+120MVA | — | — | ± 2% | ± 2% | ± 2% |
| 功率因数测量 Power factor measurement | | PF | -1~1 | — | — | ± 2% | ± 2% | ± 2% |
| 电能测量 Energy measurement | | E.P<br>E.Q<br>E.S | -9999MWh~+9999MWh<br>-9999Mvarh~+9999Mvarh<br>-9999MVAh~+9999MVAh | ± 2.5% | — | — | — | — |
| | | | $-10^{10}$GWh~+$10^{10}$GWh<br>$-10^{10}$Gvarh~+$10^{10}$Gvarh<br>$-10^{10}$GVAh~+$10^{10}$GVAh | — | — | ± 2% | ± 2% | ± 2% |
| 频率测量 Frequency measurement | | | 45Hz ~ 65Hz | ± 0.1Hz | — | ± 0.05Hz | ± 0.05Hz | ± 0.05Hz |
| 基波及谐波测量 Fundamental and harmonic measurement | 基波测量 Fundamental measurement | 基波电流$I_{1-1}$、$I_{2-1}$、$I_{3-1}$、$I_{N-1}$ Fundamental current | (0.2In ~ 1.2In)A | — | — | — | ± 1.5% | ± 1.5% |
| | | 基波线电压（$U_{12-1}$、$U_{23-1}$、$U_{31-1}$）<br>基波相电压（$U_{1N-1}$、$U_{2N-1}$、$U_{3N-1}$）<br>Fundamental line voltage<br>Fundamental phase voltage | 30V~690V | — | — | — | ± 0.5% | ± 0.5% |
| | | 基波功率 Fundamental power<br>Pf<br>Qf<br>Sf | -120MW~+120MW<br>-120Mvar~+120Mvar<br>-120MVA~+120MVA | — | — | — | ± 2% | ± 2% |
| | 谐波测量 Harmonic measurement | 谐波电流含有率（HRIh）<br>谐波电压含有率（HRUh）<br>Harmonic current ratio<br>Harmonic voltage ratio | 0~1000% | — | — | — | ± 5% | ± 5% |
| | | 电流总谐波畸变率[THDi、thdi]<br>电压总谐波畸变率[THDu、thdu]<br>Total harmonic distortion of current<br>Total harmonic distortion of voltage | 0~1000% | — | — | — | ± 5% | ± 5% |

Note: "–" means that the controller does not have the measurement function.
注：—为该类型控制器无此测量功能。

（五）维护功能

● 触头当量磨损能显示断路器主触头当量磨损次数占断路器通电操作循环次数的百分比数值。

● 智能型控制器有电时操作次数

在智能型控制器有电时，记录断路器操作次数的总和。

● 自诊断功能（存储器故障、微处理器超温）

当存储器不能正常存储信息发生故障的时候，智能控制器能发出报警信号。

当微处理器发生故障或局部环境温度超过80℃（允差±5℃）时，智能控制器能立即发出报警信号。

● 附件监测（分励脱扣器、合闸电磁铁、欠电压脱扣器、贮能电机断线）

智能控制器可在线监测分励脱扣器、合闸电磁铁、欠电压脱扣器、贮能电机的线圈是否断线，当发生故障时可通过智能控制器查询具体发生故障的附件。

● 历史记录

智能控制器可显示从运行以来曾出现的历史最大电流、需用电流最大值；在通信时上位机可显示从运行以来曾出现的历史最大最小电流、需用电流最大值、历史最大最小电压、峰值需用功率、功率因数最大最小值、频率最大最小值。

● 故障记忆功能

EP、EQ、EG型智能控制器可显示最近10次报警记录和10次脱扣记录，报警原因、脱扣原因、报警阀值、脱扣阀值、故障时间，EN、EA型智能控制器显示最近1次故障脱扣记录。

● 故障录波功能

当线路发生故障断路器脱扣时，能记录此故障12个周波的波形图。

（五）Maintenance function

● The contact wearing can indicate the percentage of the equivalent to wearing times of main contact to power operation cycles of the circuit breaker.

● Peration times of intelligent controller on electricity

When intelligent controller is on electricity the total operation times of circuit breaker is recorded.

● Self-diagnosis function (against memory error, and microprocessor over-temperature)

Intelligent controller alarms when memory fails to work as normal.

When microprocessor breaks down or the local ambient temperature rises over 80℃ (tolerance is ±5℃) the intelligent controller sends out alarm signals immediately.

● Accessories monitoring (disconnecting of shunt release, closing electromagnet, under-voltage release or charging energy motor )

Intelligent controller online monitors if the disconnecting of shunt release, closing electromagnet, under-voltage release and charging motor is disconnected. When error occurs it can be inquired by the intelligent controller that which accessory exactly fails.

● History

Intelligent controller displays the maximum of current and demand current since running. In communication the up-level device displays the maximum and minimum of current, voltage, power factor and frequency, the maximum of demand current and demand power at peak since running.

● Fault-memory function

Type EP, EQ, and EG intelligent controllers display last 10alarm records and release records, alarm reason, release reason, alarm threshold, release threshold and failure time. Type EN, EA intelligent controller displays last 1 release record.

● Fault-recorder function

12 cycles of waveform are recorded when the circuit breaker trips as a result of faults.

（六）智能控制器功能释义

一、过电流保护功能

过电流保护由相线过电流保护和中性线过电流保护（三极断路器带外接中性线电流互感器具有中性线过电流保护）组成，相线过电流保护的电流、时间参数一般由制造厂按用户订货要求整定（用户自己也可自行整定），中性线过电流保护的电流、时间参数按比例自动跟踪相线整定值，具体如下：

三极断路器＋外接中性线电流互感器

中性线整定电流用户可由菜单设定四种方式：关闭（OFF）、50%In、100%In、200%In。200% In中性线保护（如3次谐波含量高的情况下）时，配电系统的中性线截面应为2倍相线截面。

● 过载长延时保护

过载长延时反时限保护，整定电流$Ir_1$可调；

过载长延时延时时间$t_1$可调；

EA/EP/EQ智能控制器过载长延时特性多曲线可调，分别有通用型（$I^2t$）、非常反时限(It)、高压熔丝配合型($I^4t$)，以满足上下级过载保护选择性和匹配需要。EN控制器仅具有$I^2t$特性。

● 短路短延时保护（可关断-OFF）

短路短延时反时限保护（$I^2t$ ON）,整定电流$Ir_2$可调；

短路短延时定时限保护（$I^2t$ OFF），整定电流$Ir_2$可调；

短路短延时延时时间$t_2$可调。

● 短路瞬时保护

短路瞬时（可关断-OFF），整定电流$Ir_3$可调

（六）Functions of intelligent controller

一、Over-current protection

The over-current protection is composed of phase and neutral line protection (four-pole circuit breaker and three-pole circuit breaker with current transformer linking externally to neutral N) from over-current. The parameters of current and time of phase line over-current protection can be set by the company in terms of the requirements of users (can be set by customers themselves); the parameters of current and time of neutral line over-current protection can be set by tracking the phase lines automatically in proportion, all these mainly follow situation:

Three-pole circuit breaker current mutual inductor with the neutral line connected externally

Customers can setup into four types from menu: turn off, 50%In, 100%In, and 200%In. When 200%In neutral line protection (if it has a high triple frequency harmonic) is on, the neutral line cross-section should be double leg of a circuit cross-section in the electrical power distribution system.

● Overload long-time delay protection

For inverse overload long-time delay protection the setting current Ir1 can be adjusted.

The delay time t1 of overload long-time delay can be adjusted.

For the overload long-time delay characteristics of the type EA/EP/EQ the curves can be adjusted. There are common type ($I^2t$), uncommon inverse time type (It) and high-voltage fuse concert type ($I^4t$) to match higher-up and lower-level' s overload protection needs.

● Short-circuit short-time delay protection (can be OFF)

For inverse short-circuit short-time delay protection ($I^2t$ ON) the setting current Ir2 can be adjusted.

For inverse short-circuit short-time delay protection ($I^2t$ OFF) the setting current Ir2 can be adjusted.

● Instantaneous short-circuit protection

The setting current Ir3 of instantaneous short circuit (can be OFF) can be adjusted.

二、接地故障保护（可关断–OFF）

接地故障定时限保护，整定电流Ir4可调

延时时间t4可调

接地故障保护方式

1. 矢量和型

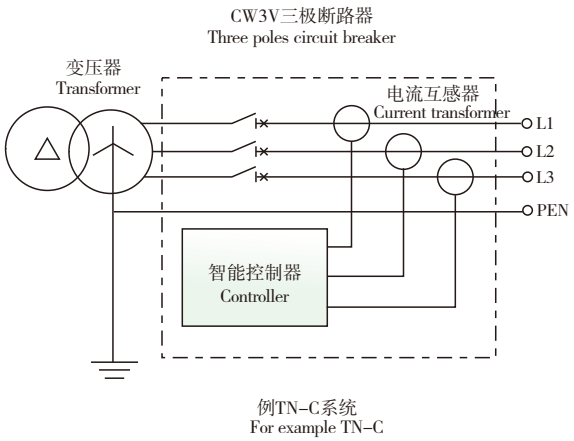
二、Earth–fault protection (can be OFF)

For definite earth–fault protection the setting current Ir4 can be adjusted.

Delay time t4 can be adjusted.

Protection ways of earth–fault

1.Vectorial summation type




例TN–C系统
For example TN–C

● TN–C、TN–C–S、TN–S配电系统中选用CW3V三极断路器未接外接中性线N电流互感器

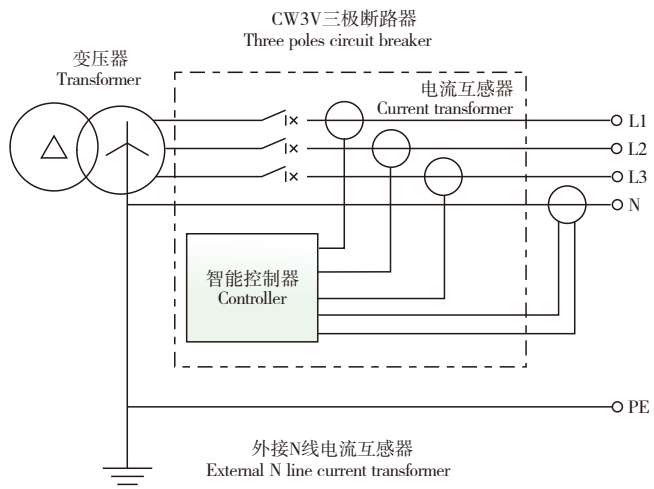
接地故障保护信号只取三相电流的矢量和

保护特性为定时限保护

● CW3V circuit breakers with three poles are used in the power distribution system of TN–C, TN–C–S and TN–S without additional current transformer of neutral line N

The signal of earth–fault protection from the vectorial summation of three poles of current

Characteristic of definite protection




例TN–S系统
For example TN–S

● TN–S配电系统中选用CW3V三极断路器外接中性线N电流互感器作接地故障保护用（接6号、7号二次回路接线端子），互感器安装地点距离断路器最大为2米

接地故障保护信号取三相电流及N相电流的矢量和

保护特性为定时限保护

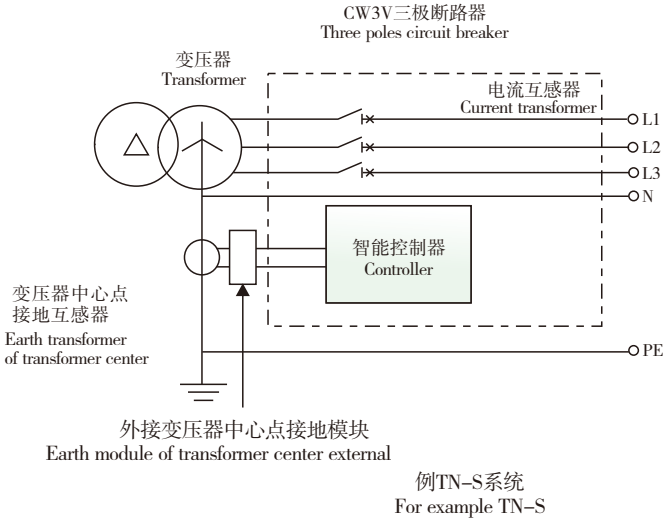
● CW3V circuit breakers with three poles are used in the power distribution system of TN–S.

N line current transformer connected externally, which is installed 2meters at maximum from the circuit breaker, takes the hole of earth–fault protection (in connection with No.6 and No.7 wiring terminals of secondary circuit)

The signal of earth–fault protection from the vectorial summation of three poles of current and N phase current

Characteristic of definite protection

2、变压器中心点接地型
Earth type of transformer center




注：图中电流互感器为有效值采样。
Note:current transformer in diagrams is r.m.s. responsive.

TN-S配电系统中选用变压器中心点接地保护

变压器中心点接地互感器，作接地故障电流采样用

变压器中心点接地互感器距离需选配的外接变压器中心点接地模块可至100m，接地模块至断路器最长2m，接地模块接至端子号为48、50二次回路接线端子

接地故障保护信号直接取自变压器中心点接地线

保护特性为定时限保护

TN-S distribution system selects transformer's center earth type protection.

Earth transformer with transformer's center takes the hole of sampling earth-fault current.

The distance from earth transformer with transformer's center to externally connected transformer's center earth module which needs to select is up to 100m. The distance from earth module which is in connection with No.48 and No.50 wiring terminals of secondary circuit to circuit breaker is up to 2m.

Earth-fault protection signal is from earth line of transformer.

Characteristic of definite protection

三、过载预报警功能

主要用于对重要负荷的监测。智能控制器的一种附加功能，当断路器电流上升并超过预报警电流整定值时发生预报警信号，此时预报警灯闪烁；当超过一定时间(tp)后，预报警灯常亮，并且继电器输出信号；当电流降至设定值以下或过载脱扣后，预报警功能复位。

四、电流不平衡保护

主要用于对三相电流控制要求较高的场合。当三相电流不平衡度大于动作阈值整定值，并超过动作延时（定时限动作），断路器跳闸或发出报警信号。如此后三相电流不平衡度小于返回阈值整定值，并超过返回延时（定时限动作），断

三、Overload pre-alarm function

It is mainly used for the monitoring of important load. An additional function of intelligent controller is that pre-alarm signal occurs when circuit breaker current rises over the setting value and pre-alarm light flashes at the moment. The pre-alarm light is always on after a period of time (tp) and circuit breaker outputs signals. Pre-alarm function resets when current reduces below the setting value or circuit breaker trips.

四、Current unbalance protection

It is mainly used in occasions that need high control of three-phase current. The circuit breaker trips or sends out alarm signals when three-phase current disequilibrium reaches the setting value of action threshold and rises over the action delay (definite operation). The circuit breaker lifts the alarm

路器解除报警信号。

电流不平衡保护功能可设定开启或关闭，开启包括发出报警信号或跳闸。

五、断相保护

主要用于发生断相会使设备不正常运行或使设备损坏场合，为电流不平衡的极端情况。当任意一相断电或三相电流不平衡度大于动作阈值整定值，并超过动作延时（定时限动作），断路器跳闸或发出报警信号。如此后三相电流不平衡度小于返回阈值整定值，并超过返回延时（定时限动作），断路器解除报警信号。

此断相保护功能可设定开启或关闭，开启包括发出报警信号或跳闸。

六、电流需用保护

主要用于工艺过程控制的需要。当某相的需用电流大于动作阈值整定值，并超过动作延时（定时限动作），断路器跳闸或发出报警信号。如此后此相的需用电流小于返回阈值整定值，并超过返回延时（定时限动作），断路器解除报警信号。

电流需用保护功能可设定开启或关闭，开启包括发出报警信号或跳闸。

七、低电压保护

主要用于低电压会使设备不正常运行或使设备损坏场合。当电路中任一相电压低于动作阈值整定值，并超过动作延时（定时限动作），断路器跳闸或发出报警信号。如此后电压大于返回阈值整定值，并超过返回延时（定时限动作），断路器解除报警信号。

低电压保护功能可设定开启或关闭，开启包括发出报警信号或跳闸。

八、过电压保护

主要对外来的过电压或高压端对地故障引起

signals if the subsequent three-phase current disequilibrium is less than the setting value of return threshold and rises over the return delay (definite operation).

The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

五、Open-phase protection

It is the extreme case of current imbalance and mainly used in occasions that open-phase makes equipment not run as normal or broken. The circuit breaker trips or sends alarm signals when any one phase is open or three-phase current disequilibrium reaches the setting value of action threshold and rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent three-phase current disequilibrium is less than the setting value of return threshold and rises over the return delay (definite operation).

The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

六、Demand current protection

It is mainly used for process control. The circuit breaker trips or sends alarm signals when demand current of some phase reaches the setting value of action threshold and rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent demand current of the phase is less than the setting value of return threshold and rises over the return delay (definite operation).

The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

七、Under-voltage protection

It is mainly used in occasions that under-voltage makes equipment not run as normal or broken. The circuit breaker trips or sends alarm signals when the voltage of any one phase is lower than the setting value of action threshold but rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent voltage is less than the setting value of return threshold and rises over the return delay (definite operation).

The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

八、Over-voltage protection

低压端过电压的保护。当电路中任一相电压大于动作阈值整定值，并超过动作延时（定时限动作），断路器跳闸或发出报警信号。如此后电压小于返回阈值整定值，并超过返回延时（定时限动作），断路器解除报警信号。

过电压保护功能可设定开启或关闭，开启包括发出报警信号或跳闸。

九、电压不平衡保护

主要对由中心点电位漂移引起相间不平衡进行保护。当三相电压不平衡度大于动作阈值整定值，并超过动作延时（定时限动作），断路器跳闸或发出报警信号。如此后三相电压不平衡度小于返回阈值整定值，并超过返回延时（定时限动作），断路器解除报警信号。

电压不平衡保护功能可设定开启或关闭，开启包括发出报警信号或跳闸。

十、逆功率保护

用于发电机保护，当倒送功率时，发电机变为电动机运行，可能使发电机损坏。当功率的流向和设定功率方向相反，且大于动作阈值整定值，并超过动作延时（定时限动作），断路器跳闸或发出报警信号。如此后电路中的功率小于返回阈值整定值，并超过返回延时（定时限动作），断路器解除报警信号。

逆功率保护功能可设定开启或关闭，开启包括发出报警信号或跳闸。

十一、过频保护

用于发电机保护。当电路频率大于动作阈值整定值，并超过动作延时（定时限动作），断路器跳闸或发出报警信号。如此后电路中的频率小于返回阈值整定值，并超过返回延时（定时限动作），断路器解除报警信号。

过频保护功能可设定开启或关闭，开启包括

It is mainly used in occasions that there is external over-voltage or the low-voltage side is over-voltage caused by high-voltage side's earth-fault. The circuit breaker trips or sends alarm signals when the voltage of any one phase reaches the setting value of action threshold and rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent voltage is less than the setting value of return threshold and rises over the return delay (definite operation).

The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

九、Voltage unbalance protection

It is mainly used in occasions that there is phase unbalance caused by center potential drift. The circuit breaker trips or sends out alarm signals when three-phase voltage disequilibrium reaches the setting value of action threshold and rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent three-phase voltage disequilibrium is less than the setting value of return threshold and rises over the return delay (definite operation).

The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

十、Inverse power protection

It is used to protect the generator. The generator turns to a motor that may cause damage to it when the power is inverse. The circuit breaker trips or sends alarm signals when power direction is in contrast with the setting one and reaches the setting value of action threshold and rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent circuit power is less than the setting value of return threshold and rises over the return delay (definite operation).

The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

十一、Over-frequency protection

It is used to protect the generator. The circuit breaker trips or sends alarm signals when circuit frequency reaches the setting value of action threshold and rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent

发出报警信号或跳闸。

十二、欠频保护

用于发电机保护。当电路频率低于动作阈值整定值，并超过动作延时（定时限动作），断路器跳闸或发出报警信号。如此后电路中的频率大于返回阈值整定值，并超过返回延时（定时限动作），断路器解除报警信号。

欠频保护功能可设定开启或关闭，开启包括发出报警信号或跳闸。

十三、相序保护

用于对相序有要求场合。当检测到相序与动作阈值不同，超过动作延时（定时限动作），断路器跳闸或发出报警信号。如果一相或多相电压不存在时，此功能自动退出。

相序保护功能可设定开启或关闭，开启包括发出报警信号或跳闸。

十四、电流卸载功能

主要用于需监测主回路电流使主回路不过负荷运行场合。可设置2路卸载输出。当流过断路器电流大于动作阈值整定值，并超过动作延时（反时限动作），断路器发出信号分断次要负载或报警；以后当流过断路器电流小返回阈值整定值，并超过返回延时（定时限动作），断路器发出信号解除报警。

电流卸载功能可设定开启或关闭。

circuit power is less than the setting value of return threshold and rises over the return delay (definite operation).

The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

十二、Under-frequency protection

It is used to protect the generator. The circuit breaker trips or sends alarm signals when circuit frequency is lower than the setting value of action threshold but rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent circuit power is less than the setting value of return threshold and rises over the return delay (definite operation).

The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

十三、Phase sequence protection

It is used in occasions that the phase sequence is required. The circuit breaker trips or sends alarm signals when it detects that phase sequence is different from action threshold and rises over the action delay (definite operation). The function automatically quits when there is no one-phase voltage or multi-phase voltage.

The function can be ON or OFF. The circuit breaker sends out alarm signals or trips when it is ON.

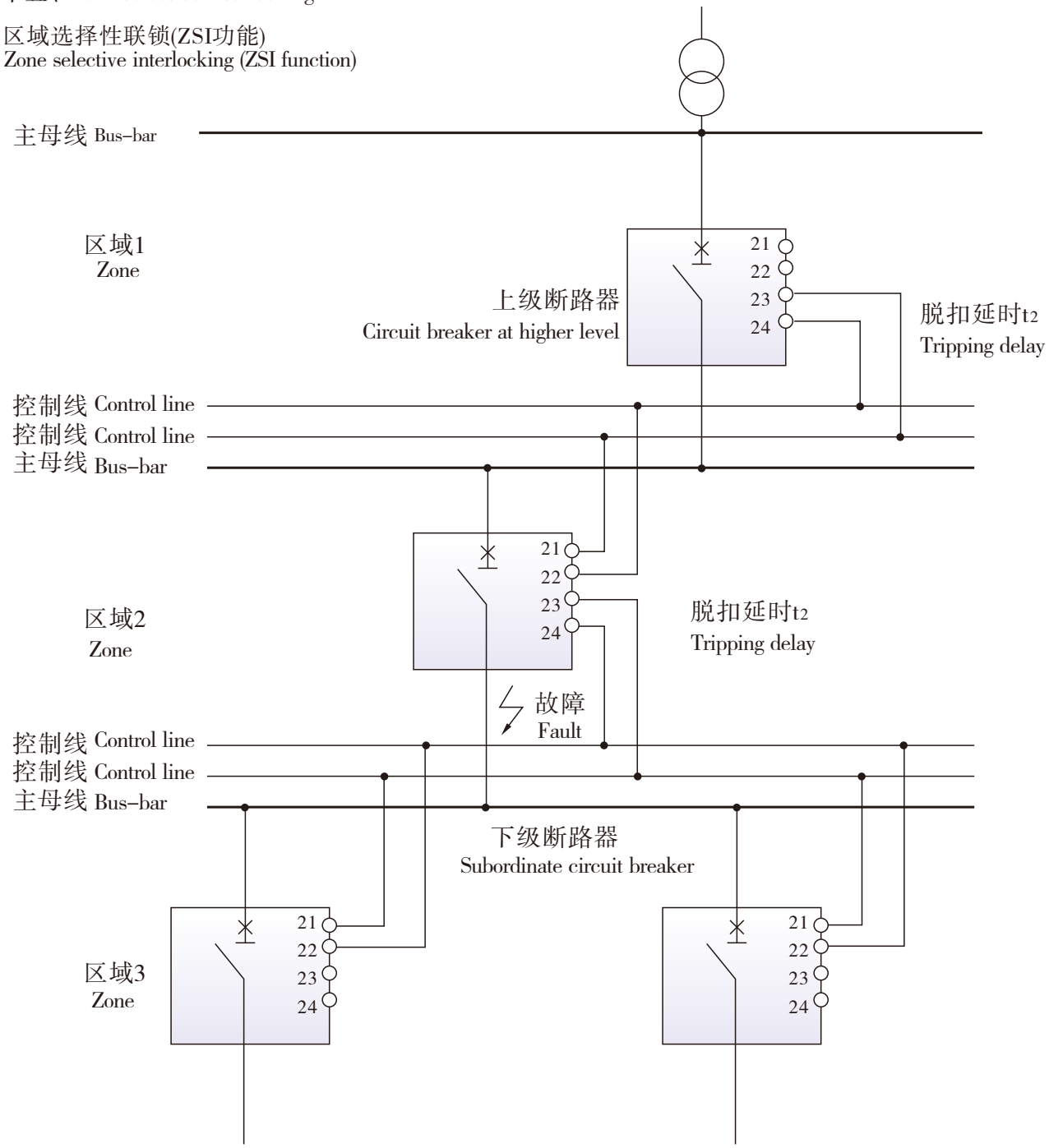
十四、Current shedding function

It is used in occasions that the main circuit current is monitored to keep the main circuit not to overload and it can be set to 2 lines shedding output. The circuit breaker alarms or sends alarm signals to trip the subordinate load when require current of some phase reaches the setting value of action threshold and rises over the action delay (definite operation). The circuit breaker lifts the alarm signals if the subsequent required current of the phase is less than the setting value of return threshold and rises over the return delay (definite operation).

The function can be ON or OFF.

十五、区域选择性联锁
十五、Zone selective interlocking

区域选择性联锁(ZSI功能)
Zone selective interlocking (ZSI function)




注：21,22,23,24为断路器二次回路接线端子。

Note: 21, 22, 23, 24serve as the wiring terminals of secondary circuit.

当多台CW3V断路器上下连接在一起时，选择区域选择性联锁(ZSI)功能可确保断路器上下级完全选择性保护，这样减少了故障动作范围，并缩短了断路器的分断时间。此功能适用于断路器短路短延时($I^2t$ OFF)和接地故障保护。

如上图所示，控制线可联锁多个断路器。

检测到故障的智能控制器（区域2）送一个信号给上级断路器（区域1）并检查下级断路器（区域3）到达的信号。如果有下级断路器送过来的信号，断路器将在脱扣延时期间保持合闸。如果下级没有送过来信号，断路器将瞬时断开，不管脱扣保护是否有延时。

注：末级23，24应短接。

十六、MCR功能

在闭合操作时，如接通电流超过预定值时，断路器无任何人为延时断开，且当断路器处于闭合位置时不动作。

十七、谐波分析功能

测量基波电流、基波线电压、基波相电压、基波功率及3-31次各次奇次谐波电流含有率(HRIh)、谐波电压含有率(HRUh)、谐波电流总畸变率[THDi、thdi]、谐波电压总畸变率[THDu、thdu]。

● 谐波含有率(HR)

周期性交流量中含有的第h次谐波分量的方均根值与基波分量的方均根值之比（用百分数表示）。

第h次谐波电流含有率以HRIh表示。

$$HRI_h = \frac{I_h}{I_{1-1}} \times 100\%$$

注：式中Ih为A相第h次谐波电流（方均根值）；

第h次谐波电压含有率以HRUh表示。

$$HRU_h = \frac{U_h}{U_{12-1}} \times 100\%$$

注：式中Uh为A-B相间第h次谐波线电压。

● 总谐波畸变率(THD、thd)

周期性交流量中的谐波含量与其基波分量的

When several circuit breakers are linked together up and down zone selective interlocking (ZSI) can ensure fully-selective protection of circuit breakers at higher or lower level so as to reduce the range of action by fault and the breaking time of circuit breakers. This function serves for short circuit short-time delay ($I^2t$ OFF) and earth-fault protection of circuit breakers.

As the sketch shown above, control lines can interlock with pieces of circuit breakers.

After detecting the fault the intelligent controller (zone2) will send out a signal to circuit breakers (zone1) at higher level and check whether the signal of circuit breakers (zone3) at lower level arrives. If circuit breakers at lower level send out a signal, the circuit breaker will be on at the time duration of release delay; if circuit breakers at lower level do not send out a signal, the circuit breaker will break off instantly no matter whether the release has the protection or delay.

Note: The end 23 and 24 should be short-circuited.

十六、MCR function

During a closing operating, if making current exceeds a predetermined value, circuit breaker is opened without any intentional time-delay, and which is rendered inoperative when circuit breaker is in the closed position.

十七、Harmonic analysis function

Fundamental current, fundamental line voltage, fundamental phase voltage, fundamental power, odd harmonic current ratio (HRIh) for the third to thirty-first, harmonic voltage ratio (HRUh), total harmonic distortion of current (THDi, thdi) and total harmonic distortion of voltage (THDu, thdu) can be measured.

● Harmonic ratio (HR)

The ratio of RMS of hth harmonic component in the periodical alternating quantum to RMS of fundamental component (express by percent)

Harmonic current ratio of hth expresses HRIh.

$$HRI_h = \frac{I_h}{I_{1-1}} \times 100\%$$

Note: Ih is harmonic current of hth of phase A (RMS).

Harmonic voltage ratio of hth expresses HRUh.

$$HRU_h = \frac{U_h}{U_{12-1}} \times 100\%$$

● Note: Uh is harmonic line voltage of hth between phase A and phase B.

Total harmonic distortion (THD, thd)

方均根值之比(THD)用百分数表示。

$$THD_i=\frac{\sqrt{\sum_{h=2}^{\infty}I_h^2}}{I_{1-1}}\times 100\%$$

$$THD_u=\frac{\sqrt{\sum_{h=2}^{\infty}U_h^2}}{U_{12-1}}\times 100\%$$

注：式中Ih为A相第h次谐波电流（方均根值）；Uh为A-B相间第h次谐波线电压（方均根值）。

周期性交流量中的谐波含量与该周期性交流量的方均根值之比(thd)(用百分数表示)。

$$thd_i=\frac{\sqrt{\sum_{h=2}^{\infty}I_h^2}}{I_1}\times 100\%$$

$$thd_u=\frac{\sqrt{\sum_{h=2}^{\infty}U_h^2}}{U_{12}}\times 100\%$$

注：式中Ih为A相第h次谐波电流（方均根值）；Uh为A-B相间第h次谐波线电压（方均根值）。

十八、通信功能

可通信CW3V断路器通过R5485接口与上位机连接可实现对断路器的远距离遥控、遥信、遥调、遥测，用户可在Modbus、Profibus、Devicenet、CAN中任选一种协议进行通信。

通信协议

使用Modbus-RTU模式。

通信接口

标准的RS485接口。

Modbus：波特率19200bps(支持1200、2400、4800、9600、38400bps)。

Profibus：波特率 9.6K、19.2K、93.75K、187.5K、500K、1.5M、3M、6M、12M；

Devicenet：波特率 125K、250K、500K；

CAN：波特率：5K、10K、20K、40K、50K、80K、100K、125K、200K、250K、400K、500K、666K、800K、1000K。

通信地址：1-119。

帧格式：

1位起始位，8位数据，

2位停止位，偶校验（支持无校验、奇校验）。

网络特性

通信线路为双绞屏蔽线。

一条线路可同时连接32台可通信断路器（带

The ratio of harmonic content in the periodical alternating quantum to RMS of fundamental component (THD) (express by percent)

$$THD_i=\frac{\sqrt{\sum_{h=2}^{\infty}I_h^2}}{I_{1-1}}\times 100\%$$

$$THD_u=\frac{\sqrt{\sum_{h=2}^{\infty}U_h^2}}{U_{12-1}}\times 100\%$$

Note: Ih is harmonic current of hth of phase A (RMS);

Uh is harmonic line voltage of hth between phase A and phase B (RMS).

The ratio of harmonic component in the periodical alternating quantum to RMS of periodical alternating quantum (thd) (express by percent).

$$thd_i=\frac{\sqrt{\sum_{h=2}^{\infty}I_h^2}}{I_1}\times 100\%$$

$$thd_u=\frac{\sqrt{\sum_{h=2}^{\infty}U_h^2}}{U_{12}}\times 100\%$$

Note: Ih is harmonic current of hth of phase A (RMS);

Uh is harmonic line voltage of hth between phase A and phase B (RMS).

十八、Communicative

Communicative CW3V breaker can achive these of tele-control,tele-communication,tele-adjustment and tele-detection by RS485 interface to upper computer,user may select one protocol of Modbus,Profibus,Devicenet and CAN

Communication protocol

The application of Modbus-RTU mode

Communication interface

Standard interface: RS485

Modbus：band rate 19200bps(in favor of 1200、2400、4800、9600、38400bps)。

Profibus：band rate 9.6K、19.2K、93.75K、187.5K、500K、1.5M、3M、6M、12M；

Devicenet：band rate 125K、250K、500K；

CAN：band rate 5K、10K、20K、40K、50K、80K、100K、125K、200K、250K、400K、500K、666K、800K、1000K。

Communication address: 1 – 119

Network characteristic

Twisted-pair shielded cables serve as communication lines.

One line can link up 32 pieces of communicative circuit breaker at the same time (16 pieces of circuit breakers with components of draw-out socket communication module).

Wiring distance is 1200m at maximum but the distance of communication can be extended by equipping with repeaters additionally.

抽屉座通信模块组件的断路器为16台）。

最大接线距离1200米，可通过加装中继器延长通信距离。

通信数据

实时电流、电压、基波电流、基波电压、功率、功率因数、电能、频率、谐波电流电压含有率、谐波电流电压总畸变率数据。

报警、故障脱扣（选择故障脱扣信号附件）、储能信号（选择储能信号附件）、欠电压（选择欠电压信号附件）、合闸准备就绪（选择合闸准备就绪信号附件）、分合闸位置等断路器状态数据。

断路器本体位置（需购买抽屉座通信模块组件）。

断路器整定值的读取和修改。

故障记录数据。

断路器产品编号、型号等概要数据。

断路器的远程合分闸操作。

Communication data

Real-time current, voltage fundamental current, fundamental voltage, power, power factor, energy, harmonic current or voltage ratio and total distortion of current or voltage.

State data of circuit breakers such as alarm, fault, energy-storage, under-voltage, ready-for-closing and the positions of closing and opening etc.

The position of main body of the circuit breaker (components of communication module of draw-out socket need to be purchased).

The fetching and modification of the setting values of circuit breakers.

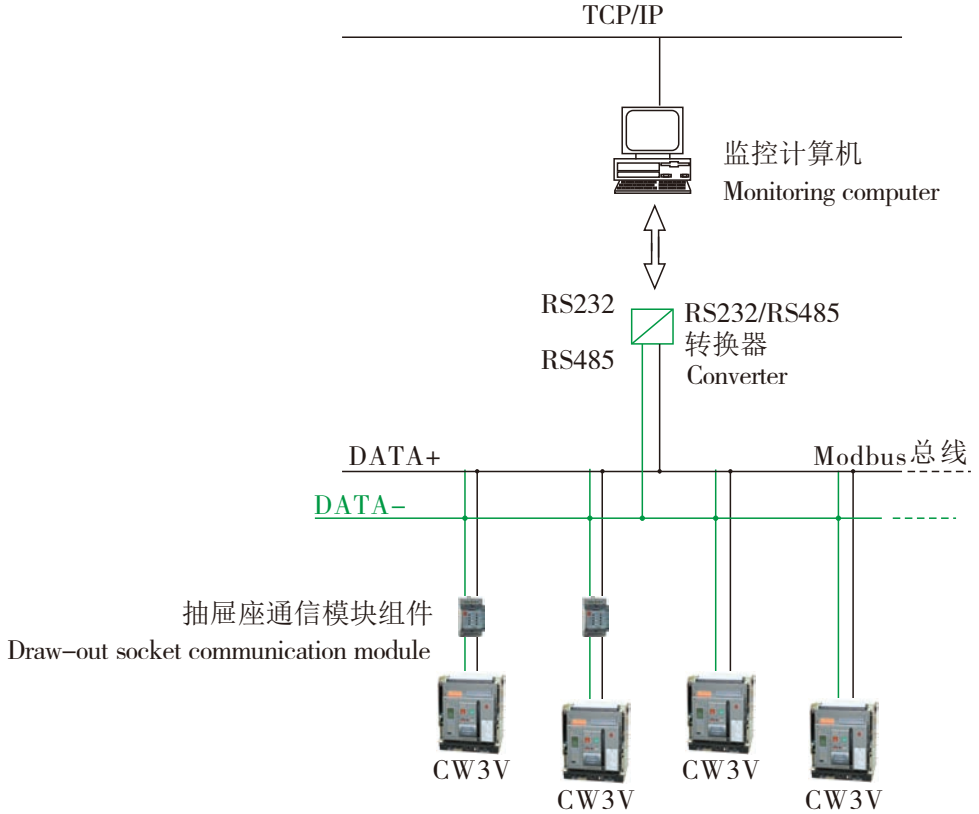
Recorded data of fault last time.

Outline data such as serial numbers and the type etc of circuit breakers.

Long-distance operation if closing and opening.

断路器通信系统连接示意图

Linking diagram of communication system




注：抽屉座通信模块组件为选购配件，当用户选用抽屉式断路器需远程读取本体位置时需选用。

Note: As the accessory of selective purchase, draw-out socket communication module should be selected into use when users read the location of main body in long distance by the choice of draw-out circuit breakers.

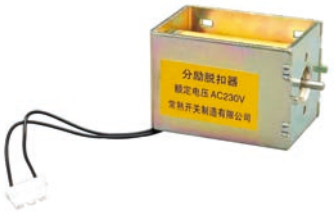
标配附件 Normally deployed accessories

- 分励脱扣器 Shunt release

可远距离操纵使断路器断开 To break the circuit breaker by remote control

特性 Characteristics

| 型号 Type | FFT/W325 | | | |
|---|---|---|---|---|
| 配用断路器 Fitting breaker | CW3V-2000/3200 | | | |
| 额定控制电源电压 Us(V) Rated voltage of control power supply | AC400 | AC230 | DC220 | DC110 |
| 瞬时电流 (A) Instantaneous current | 0.7 | 1.3 | 1.3 | 2.4 |
| 动作电压 (V) Operating voltage | (0.7~1.1)Us | | | |
| 分闸时间 (ms) Opening time | 不大于30 No more than 30 | | | |




注：根据用户需要，本公司可提供分励脱扣器长期工作型。

Note: The manufacture provides shunt release of long-term work type according to users' needs.

- 合闸电磁铁 Closing electromagnet

贮能结束后，合闸电磁铁能使操作机构的贮能弹簧力瞬间释放，使断路器快速闭合。

After the circuit breaker ends up its energy storage the closing electromagnet will make the energy storing spring to release its energy instantly so that the circuit breaker is closed quickly.

特性 Characteristics

| 型号 Type | FHD/W325 | | | |
|---|---|---|---|---|
| 配用断路器 Fitting breaker | CW3V-2000/3200 | | | |
| 额定控制电源电压Us(V) Rated voltage of control power supply | AC400 | AC230 | DC220 | DC110 |
| 瞬时电流(A) Instantaneous current | 0.7 | 1.3 | 1.3 | 2.4 |
| 动作电压(V) Operating voltage | (0.85~1.1)Us | | | |
| 合闸时间(ms) Closing time | 不大于70 No more than 70 | | | |


- 电动操作机构 Motor driven operating mechanism

断路器具有电动机贮能及自动再贮能功能；断路器亦可手动贮能

The circuit breaker has the function of motor driven energy storage and automatic energy-restoring. The energy storage can also be done manually.

特性 Characteristics

| 型号 Type | FDC/W325 | FDC/W340 |
|---|---|---|
| 配用断路器 Fitting breaker | CW3V-2000 | CW3V-3200 |
| 额定控制电源电压Us(V) Rated voltage of control power supply | AC400 / AC230 / DC220 / DC110 | |
| 动作电压(V) Operating voltage | (0.85~1.1)Us | |
| 功耗(VA/W) Power Consumption | 192 | |
| 储能时间 (s)Charging time | 不大于5 No more than 5 | |

● 辅助开关 Auxiliary switch

额定值 Rated value

| 型号 Type | FFC/W3254Z | FFC/W32544 | FFC/W3256Z | FFC/W32566 |
|---|---|---|---|---|
| 型式 Specification | 4组转换触头<br>4 groups of changeover contacts | 4常开4常闭<br>4 pieces of normally-opened contacts (NO) and 4 pieces of normally-closed contacts(NC) | 6组转换触头<br>6 groups of changeover contacts | 6常开6常闭<br>6 pieces of normally-opened contacts(NO) and 6 pieces of normally-closed contacts(NC) |
| 配用断路器 Fitting breaker | CW3V-2000/3200 | CW3V-2000/3200 | CW3V-2000/3200 | CW3V-2000/3200 |
| 额定工作电压 (V) Rated operational voltage / 额定控制容量(VA/W) Rated capacity | AC400: 300 | AC230: 300 | DC220: 60 | DC110: 60 |
| 约定发热电流Ith (A) Conventional thermal current | 6 | | | |

● 抽屉式断路器“分离”位置安全挂锁装置

抽屉式断路器处于“分离”位置时，可拔出锁杆来锁定，锁定后断路器将无法摇至“试验”或“连接”位置。

挂锁用户自备,锁杆直径⌀4mm~⌀8mm。

Safety padlock mechanism of draw-out circuit breakers at the position of "separated"

When the draw-out circuit breaker indicates the positions of "separated" the locking stick can be locked with padlock after pulling out so that the rocker of the circuit breaker can not be turned to the position of "test" of "connected".

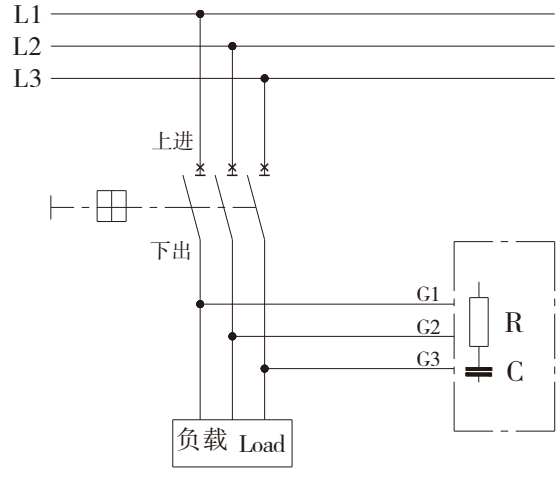
The padlock would be prepared by users, and its rod diameter should be in between ⌀4mm to ⌀8mm.

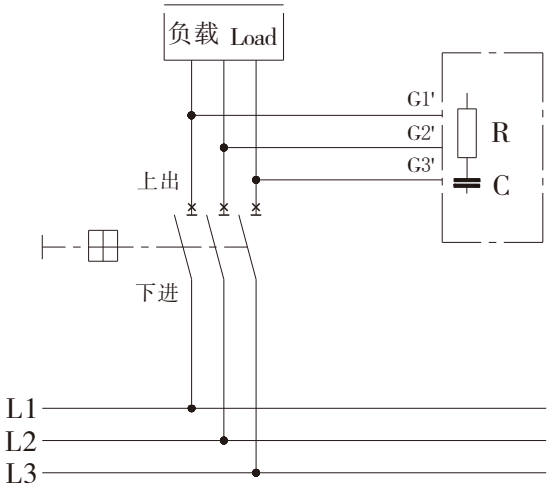
“分离”位置安全挂锁装置
Safety padlock mechanism at the position of "separated"

● 过电压吸收模块 Overvoltage suppressor

CW3V真空断路器在触头断开时会产生过电压，因此在断路器连接用电设备一侧必须安装过电压吸收模块以限制过电压。用户在订货时需确定主回路进线方式。一般分为上进线方式或下进线方式，在有些特殊场合，上母线或下母线都有可能成为进线侧，此时需选用两套过电压吸收模块同时安装。

When making and breaking inductive load (such as motor). CW3V vacuum breaker will produce over-voltage.Therefore,installation of over-voltage suppressor is needed.And the customer should make sure of the incoming manner of the main circuit when ordering.there is upper incoming or lower incoming.Sometimes don't makes sure of the upper incoming or the lower of the main circuit when ordering,and should be mounted at the upper and lower incoming.



● 选择附件 choice of accessories

● DC24V专用电源模块 DC24Vpower supply module

当有外接DC24直流电源时，建议采用DC24V电源模块。

此模块卡装于成套柜内35mm标准导轨上。


DC24V power supply is recommended when there is external DC24V power supply.

The module is installed by getting stuck into the standard guide way with 35mm in width inside the switchgear cabinet.

特性 Characteristics

| 型号 Type | FDY/W316 |
|---|---|
| 配用断路器 Fitting breaker | CW3V–2000/3200 |
| 输入电压(V) Input voltage | DC24 ± 15% |
| 输出电压(V) Output voltage | DC24 ± 0.5 |
| 输出电流(A) Output current | 0.2 |

● 直流电源模块 DC power supply module

当智能控制器外接二次回路电源为直流220V、110V时，须通过该模块转换成直流24V电源提供给智能控制器。


When power supply of the secondary circuit is DC220V or DC110V it should be transformed into DC24V by this module for power supply of the intelligent controller.

特性 Characteristics

| 型号 Type | FDY/WT |
|---|---|
| 配用断路器 Fitting breaker | CW3V–2000/3200 |
| 输入电压(V) Input voltage | DC220 / DC110 ± 15% |
| 输出电压(V) Output voltage | DC24 ± 0.5 |
| 输出电流(A) Output current | 0.5 |

● 电压转换模块 Voltage transfer module

当具有电压显示功能并且输入电压大于AC400V时，需配备此模块；模块输入端A、B、C、N接至主回路，输出端A'、B'、C'、N'接至断路器二次回路接线端子17、18、19、20。


When there has voltage display function and the inpot voltage is higher than AC400V,there should have this module;the module inpot terminalsA、 B、 C、 N connect to the main circuit and the output terminals A'、 B'、 C'、 N'connect to the circuit breaker's secondary circuit conneetion terminals17、18、19、20.

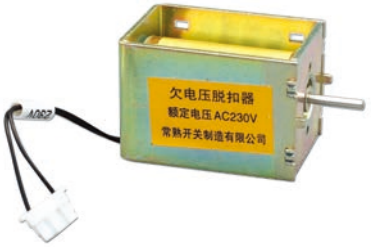
| 型号 Type | 配用断路器 Fitting breaker |
|---|---|
| FDZ/WT | CW3V–2000/3200 |

● 欠电压脱扣器 under-voltage release

欠电压脱扣器由脱扣器线圈和控制单元组成；

欠电压脱扣器动作分为瞬时动作和延时动作两种；

欠电压延时脱扣器延时时间常规分0.5s、1s、2s、3s四种，3s以上至9s作特殊规格处理，由用户与工厂协商解决，延时准确度 ± 10%。




The under-voltage release consists of release coil and control unit.

The under-voltage release works in two ways: acting instantaneously and acting in time delay.

There are four specifications of time delay for the under-voltage time delay release: 0.5s, 1s, 2s and 3s. Users should consult with the manufacture about special time delay specifications as from 3s up to 9s. The time delay accuracy is ± 10%.

特性 Characteristics

| 型号 Type | FQT/W325 | FQT/W325+FQY/W3253 | FQT/W325+FQY/W3259 |
|---|---|---|---|
| 配用断路器 Fitting breaker | CW3V-2000/3200 | | |
| 延时时间(s) Delay time | 瞬时Instantaneous | 0.5 / 1 / 2 / 3 | 0.5 / 4 / 5 / 9 |
| 额定工作电压Ue(V) Rated work voltage | AC400 / AC230 | | |
| 动作电压(V) Operating voltage | (0.35~0.7)Ue | | |
| 可靠合闸电压(V) Reliable closing voltage | (0.85~1.1)Ue | | |
| 可靠不能合闸电压(V) Reliable impossible voltage | ≤0.35Ue | | |
| 功耗(VA)，吸合/保持 Power Consumption | 300/12 | | |

注：在雷雨多发地区或在供电电源电压不稳定的电网中，推荐使用带延时的欠电压脱扣器，可防止由于短时的电压降低而使断路器脱扣。延时时间一般为0.5s、1s、2s、3s，可供用户选择。

Note: In the electrified networks where thunder and rain often happens or whose power supply is not stable, under-voltage release with time delay is highly recommended to protect the circuit breaker from releasing due to transient voltage-lowering. Generally, the delay time which is selected by users is 0.5s, 1s, 2s or 3s.

● 可编程输出模块 Programmable output module

断路器内部提供2路可编程输出模块，如用户需要，另再可提供6路可编程扩展输出模块（此模块安装于导轨上），可编程内容见“可编程输出模块项目”表；2路可编程输出模块和6路可编程扩展输出模块触头类型见“可编程输出模块触头类型”表，其中时间延时触头时间整定见“时间延时触头时间整定”表；可编程模块继电器输出电气参数见“可编程输出模块继电器电气参数”表，通电操作性能次数为$10^5$。

2 lines programmable output module is stalled in the circuit breaker and 6 lines programmable output expansion module can be provided (getting stuck into the standard guide way) according to users' need–Programmable content is in the" Items of programmable output module" table; Content types of 2 lines programmable output module and 6 lines programmable output expansion module are in the" contact types of programmable output module" table; Setting time of time delay contact is in "Setting time of time delay contact" table; Electrical parameters of relay with programmable output module is in the" electrical parameters of relay with programmable output module" table. The operation times on electricity are $10^5$.

| 型号 Type | FCM/W32 | FCM/W36 |
|---|---|---|
| 配用断路器 Fitting breaker | CW3V–2000/3200 | |
| 型式 Specification | 2路可编程输出模块2 lines programmable output module | 6路可编程输出扩展模块6 lines programmable output expansion module |

可编程输出模块项目
Items of programmable output module

| 编号 No | 功 能 Function | | 备注 Remarks |
|---|---|---|---|
| A | $I_{r0}$ | 过载预报警 Overload pre–alarm | 过载预报警及电流卸载 Overload pre–alarm and current shedding |
| B | $I_{LC1}$ | 电流卸载1 Current shedding 1 | |
| C | $I_{LC2}$ | 电流卸载2 Current shedding 2 | |
| D | $I_{r1}$ | 长延时脱扣报警 Long–time delay trip alarm | 电流保护报警 Current protection alarm |
| E | $I_{r2}$ | 短延时脱扣报警 Short–time delay trip alarm | |
| F | $I_{r3}$ | 瞬时脱扣报警 Instantaneous trip alarm | |
| G | $I_{r4}/I_{\Delta n}$ | 接地/剩余电流脱扣报警 Earth/residual current trip alarm | |
| H | Iunbal | 电流不平衡动作报警 Current unbalance operating alarm | |
| I | 断相 Open–phase | 断相动作报警 Open–phase alarm | |
| J | 超温 Over–temperature | 控制器超温报警 Over–temperature alarm | 内部故障报警 Internal fault alarm |
| K | 存储器故障 Memory fault | 存储器故障报警 Memory fault alarm | |
| L | 内部附件故障 Internal accessories fault | 内部附件故障报警 Internal accessories fault alarm | |
| M | $\overline{I}_{1}max$ | 最大需用电流动作报警 Maximum demand current operating alarm | 电流保护报警 Current protection alarm |
| N | $\overline{I}_{2}max$ | 最大需用电流动作报警 Maximum demand current operating alarm | |
| O | $\overline{I}_{3}max$ | 最大需用电流动作报警 Maximum demand current operating alarm | |
| P | $\overline{I}_{n}max$ | 最大需用电流动作报警 Maximum demand current operating alarm | |
| Q | Umin | 低电压动作报警 Under–voltage operating alarm | 电压保护报警 Voltage protection alarm |
| R | Umax | 过电压动作报警 Over–voltage operating alarm | |
| S | Uunbal | 电压不平衡动作报警 Voltage unbalance operating alarm | |
| T | 相序 phase sequence | 相序保护动作报警 Phase sequence operating alarm | 其它保护报警 Other protection alarm |
| U | $F_{MIN}$ | 欠频保护报警 Under–frequency operating alarm | |
| V | $F_{MAX}$ | 过频保护报警 Over– frequency operating alarm | |
| W | rPmax | 逆功率动作报警 Inverse frequency operating alarm | |

可编程输出模块触头类型
Contact types of programmable output module

| | |
|---|---|
| a.非闭锁触头<br>Non-interlocking contact | 故障引起的报警未消除，触头保持动作<br>It keeps operation until the failure alarm is gone. |
| b.闭锁触头<br>Interlocking contact | 触头保持动作至被复位（复位菜单）<br>It keeps operation until it is reset (reset menu). |
| c.时间延时触头<br>Time delay contact | 触头保持在可调的时间延时内或被复位（复位菜单）<br>It is kept in adjustable time delay or it is reset (reset menu). |

时间延时触头时间整定
Setting time of time delay contact

| 项目 Item | 范围 Range | 步长 Step | 精度 Precision |
|---|---|---|---|
| 延时时间触头延时时间<br>Delay time of time delay contact | 1-360s | 1s | ± 10% |

可编程输出模块继电器电气参数
Electrical parameters of relay with programmable output module

| 额定工作电压Ue/V<br>Rated operational voltage | | 约定发热电流Ith/A<br>Conventional thermal current | 额定工作电流Ie/A<br>Rated operational current | 额定控制容量<br>Rated control capacity |
|---|---|---|---|---|
| AC | 230 | 5<br>（2路可编程输出模块为1A）<br>（2 lines programmable output module is 1A） | AC-15：5<br>（2路可编程输出模块为1A）<br>（2 lines programmable output module is 1A） | 1200VA<br>（2路可编程输出模块为230VA）<br>（2 lines programmable output module is 230VA） |
| | 400 | | AC-15：3 | 1200VA |
| DC | 220 | | DC-13：0.15 | 50W |
| | 110 | | DC-13：0.4 | |

● 抽屉座位置电气指示装置 Electrical mechanism for the indication of draw-out socket' position

抽屉式断路器本体与抽屉座分别处于“分离”、“试验”、“连接”三位置时，三个位置电气指示装置可分别输出对应此三位置时电气状态信号，装置安装于抽屉座内。

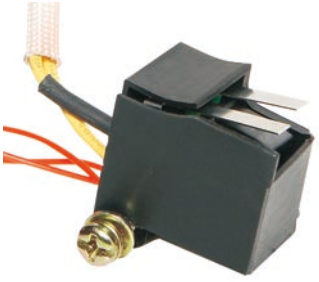
When the main body of the draw-out circuit breaker and the draw-out socket are at the position of "separated","tested" and "connected" respectively, three electrical mechanisms for the indication of draw-out socket" location can output the electrical signals corresponding with three positions above respectively. These mechanisms are installed inside the draw-out socket.

特性 Characteristics

| 型号 Type | FWZ/W325 |
|---|---|
| 配用断路器 Fitting breaker | CW3V–2000/3200 |
| 额定工作电压 Ue (V) Rated operational voltage | AC 230 |
| 约定发热电流 Ith (A) Conventional thermal current | 6 |
| 额定工作电流 Ie (A) Rated operational current | 3 |

● 合闸准备就绪电气指示模块
Electrical module for indication of ready–for–close

断路器合闸准备就绪电气指示模块，指示断路器可以准备合闸。
The electrical module indicates that the circuit breaker is ready for close.



特性 Characteristics

| 型号 Type | FHM/W325 |
|---|---|
| 配用断路器 Fitting breaker | CW3V–2000/3200 |
| 额定工作电压 Ue (V)<br>Rated operational voltage | AC 230 |
| 约定发热电流 Ith (A)<br>Conventional thermal current | 1 |
| 额定工作电流 Ie (A)<br>Rated operational current | 1 |

● 外接中性线N电流互感器 Current tramsformer with neutral line N connected externally

TN–S配电系统中与三极断路器一起使用，安装于中性线N上，安装点距离最大2m。
It is used together with circuit breaker with three poles in the power distribution system of TN–S and installed in the neutral line N with 2m at maximum far from the installation point.

| 型号 Type | 配用断路器额定电流 Fitting breaker's rated current |
|---|---|
| FDH–80 | 630A~1600A |
| FDH–120 | 2000A~3200A |
| FDH–260 | |

## ●外接变压器中心点接地单元

| 型号 Type | 配用断路器 Fitting breaker | 配置 Configuration |
|---|---|---|
| FBM/W3 | CW3V-2000/3200 | 接地模块+接地互感器<br>connected earth transformer + connected earth module |

● 外接变压器中心点接地互感器 Externally connected earth transformer with transformer's center

TN-S配电系统中与三极断路器或四极断路器一起使用，安装于变压器低压侧中心点接地线上，电流采样信号经外接变压器中心点接地单元输入断路器EA、EP、EQ智能控制器，作接地故障保护用。

It is used together with three-phase circuit breakers or four-phase circuit breakers in TN-S distribution system and installed in the earth line of transformer at the low-voltage side. Current sampling signals used for earth-fault protection are sent to type EA, EP and EQ intelligent circuits by the externally connected unit with transformer's center.

● 外接变压器中心点接地模块 Externally connected earth module with transformer's center

用于变压器中心点接地故障保护用，与外接变压器中心点接地互感器配套使用。P1、P3接外接变压器中心点接地互感器，P2、P4分别接断路器二次回路接线端子48、50。此单元卡装于成套柜内35mm标准导轨上。

It is used together with the externally connected unit with transformer's center for transformer's center earth-fault protection. P1 and P3 connect with the externally connected unit with transformer's center and P2 and P4 connect with terminals 48 and 50 of the secondary circuit. The module is installed by getting stuck to the standord guide way with 35mm in width inside the switchgear cabinet.


● 附件监测单元 Accessories detection unit

断路器安装了附件监测单元后，可对分励脱扣器、合闸电磁铁、欠电压脱扣器、贮能电机的线圈是否断线进行在线监测，确保断路器正常动作。

With accessories detection unit installed the circuit breaker can online monitor that if the coil of shunt release, closing electromagnet, under-voltage release or charging motor is disconnected to ensure the normal work of the circuit breaker.

| 型号 Type | 配用断路器 Fitting breaker |
|---|---|
| FFJ/W3 | CW3V-2000/3200 |

## ● 远程复位 Remote reset

断路器脱扣后，远程复位功能可使复位按钮复位，并可撤除故障脱扣指示。
The function can reset the reset button and remove the instructions of tripping for fault after circuit breaker trips.

特性 Characteristics

| | |
|---|---|
| 型号 Type | FYF/W3 |
| 配用断路器 Fitting breaker | CW3V-2000/3200 |
| 额定控制电源电压Us(V) Rated voltage of control power supply | AC 230 |
| 动作电压(V) Operating voltage | (0.85~1.1)Us |
| 瞬时电流(A) Instantaneous current | 1 |

## ● 储能信号电气指示装置 Electrical mechanism for the indication of energy storage signals

可电气指示断路器电动操作机构贮能、释能状况。
The function gives a electrical indication about charging and discharging situation of motor driven operating mechanism.

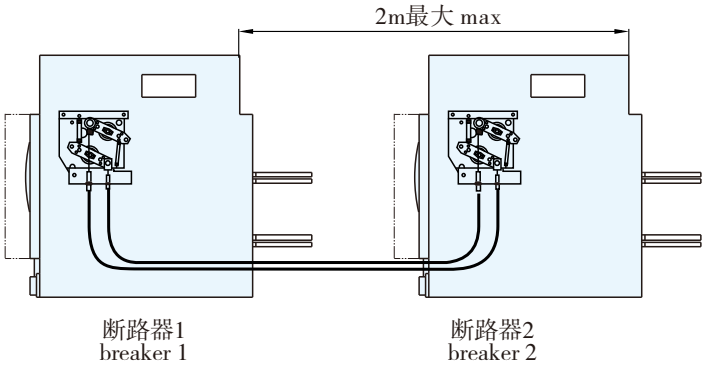
特性 Characteristics

| | |
|---|---|
| 型号 Type | FCZ/W325 |
| 配用断路器 Fitting breaker | CW3V-2000/3200 |
| 额定工作电压Ue (V) Rated operational voltage | AC 230 |
| 约定发热电流Ith (A) Conventional thermal current | 1 |
| 额定工作电流Ie (A) Rated operational current | 1 |

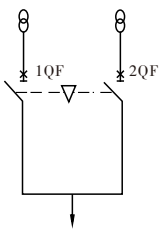
## ● 两台断路器的钢缆联锁或两台叠装断路器的联杆联锁

Two sets of circuit breakers interlocked with steel cable or stacked and interlocked with connecting rods

（两台叠装断路器联杆联锁的型式及底板开孔尺寸参见三台断路器的型式及开孔尺寸）
(the style of interlock between two sets of circuit breakers with connecting rods and aperture dimensions of their bases see the counterpart of three sets of circuit breakers)




电路图 Wiring diagram



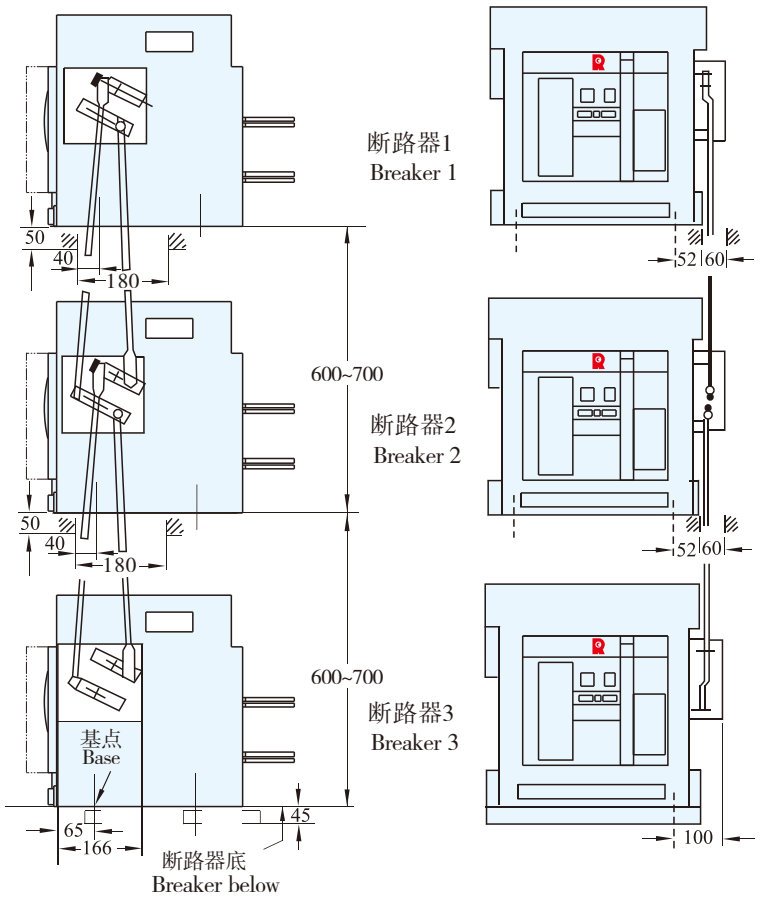

可能的运行方式 Possible operation pattern

| 1QF | 2QF |
|---|---|
| 0 | 0 |
| 0 | 1 |
| 1 | 0 |

注：钢缆联锁的钢缆长度常规为2.5m，也可提供1.5m钢缆，但用户订货时需注明。
Note：Normally 2.5m steel cable of interlock is provided, either 1.5m is but an indication is needed when marking order.

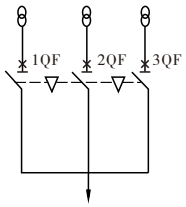
● 三台叠装断路器的联杆联锁或三台断路器的钢缆联锁
Three sets of circuit breakers stacked and interlocked with connecting rods or three sets of circuit breakers interlocked with steel cable.

● 抽屉式联杆联锁 Draw-out stacked and interlocked



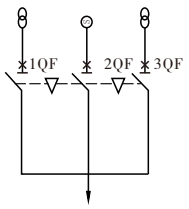

电路图 可能的运行方式
Wiring diagram Possible operation pattern

方式一：三个电源只能合一台断路器
Pattern one: three sets of power supply can only close one set of circuit breaker



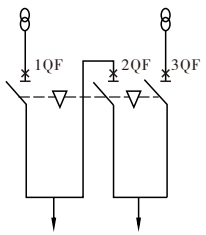

| 1QF | 2QF | 3QF |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 0 | 0 |
| 0 | 1 | 0 |
| 0 | 0 | 1 |

方式二：二个常用电源+一个备用电源
Pattern two: three sets of common power apply plus one set of alternate power supply



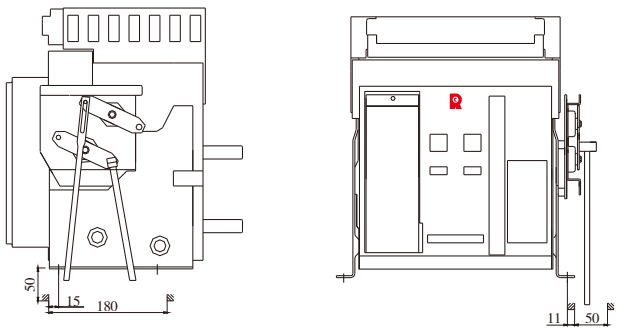

| 1QF | 2QF | 3QF |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 1 |
| 0 | 0 | 1 |

方式三：二个电源一个分段
Pattern three: three sets of power supply plus one piece of coupling bus-bar




| 1QF | 2QF | 3QF |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 0 | 0 |
| 0 | 1 | 0 |
| 0 | 0 | 1 |
| 1 | 1 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |

● 固定式联杆联锁（上下安装板间距参考抽屉式）
fixed stacked and interlocked（distance for upper to down，please seeing draw-out）

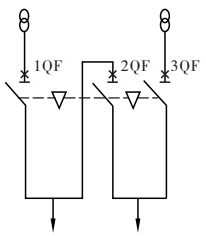



● 钢缆联锁
三台断路器钢缆联锁的型式，参见两台断路器的型式，间距最大2m。

The style of interlock between three sets of circuit breakers see the interlock between two sets of circuit breakers. The maximum distance of two circuit breakers is 2m.

电路图 可能的运行方式
Wiring diagram Possible operation pattern

方式三：二个电源一个分段
Pattern three: three sets of power supply plus one piece of coupling bus-bar




| 1QF | 2QF | 3QF |
|---|---|---|
| 0 | 0 | 0 |
| 1 | 0 | 0 |
| 0 | 1 | 0 |
| 0 | 0 | 1 |
| 1 | 1 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |

| 型号 Type | 联锁型式 Configuration | 配用断路器 Fitting breaker |
|---|---|---|
| FLS/WG2 | 2台钢缆联锁<br>2 sets of circuit breakers steel lock interlock | CW3V–2000/3200 |
| FLS/WL2 | 2台联杆联锁<br>2 sets of circuit breakers link rod interlock | CW3V–2000/3200 |
| FLS/WG3 | 3台钢缆联锁<br>3 sets of circuit breakers steel lock interlock | CW3V–2000/3200 |
| FLS/WL31 | 3台联杆联锁方式一<br>3 sets of circuit breakers link rod interlock type 1 | |
| FLS/WL32 | 3台联杆联锁方式二<br>3 sets of circuit breakers link rod interlock type 2 | |
| FLS/WL33 | 3台联杆联锁方式三<br>3 sets of circuit breakers link rod interlock type 3 | |

● “分闸”锁定装置 "opening" locking mechanism

“分闸”锁定装置可将断路器的分闸按钮锁定在分闸位置上，此时，断路器将不能闭合。

用户选装后，工厂提供锁和钥匙。一台断路器配一把锁和一把钥匙；二台断路器配二把相同的锁和一把钥匙；三台断路器配三把相同的锁和二把钥匙。

"opening" locking mechanism can lock the "OFF" button of the circuit breaker on the opening position. As a result, the circuit breaker can not be closed.

After the lock mechanism is chosen by users the manufacture would provide locks and keys. One set of circuit breaker is outfitted with one lock and one key; two sets of circuit breakers are outfitted with two locks and one key; three sets of circuit breakers are outfitted with three same locks and two keys.

“分闸”锁定装置
"Opening" locking mechanism

| 型号 Type | 型式 Configuration |
|---|---|
| FFS/W11 | 1锁1钥匙 One lock and one key |
| FFS/W21 | 2锁1钥匙 Two lock and one key |
| FFS/W32 | 3锁2钥匙 Three lock and two key |

● 按钮锁定装置 "Pushbutton" locking device

加装按钮锁定装置可防止误操作合闸或分闸按钮。
挂锁用户自备，锁杆直径Φ4～Φ8mm。

When "Pushbutton" locking device is installed it can prevent somebody from operating button of closing or opening by mistake.
The padlock would be prepared by users, and its rod should be Φ4～Φ8mm.

| 型号 Type | 配用断路器 Fitting breaker |
|---|---|
| FAN/W3 | CW3V-2000/3200 |

按钮锁定装置
Pushbutton locking device

● 计数器 Counter

计数器累计断路器机械操作的次数，用户一目了然。

The counter can count mechanical operation times accumulatively and an exact number is presented.

| 型号 Type | 配用断路器 Fitting breaker |
|---|---|
| FJS/W325 | CW3V-2000/3200 |


● 相间隔板 Interphase barriers

相间隔板加强母排间绝缘，为断路器选择件，用户需要时可配置。

Interphase barriers which strengthen insulation between bus-bars are optional and will be equipped when users need.

| 型号 Type | 配用断路器 Fitting breaker | 安装方式 The method of installation | 数量（块）amount |
|---|---|---|---|
| FXG/W1203C | CW3V-2000/3200三极 three poles | 抽屉式withdrawable | 2 |
| FXG/W1203G | CW3V-2000三极 three poles | 固定式 fixed | 2 |

相间隔板
Interphase barriers

通信选择附件 Choice of communication accessories

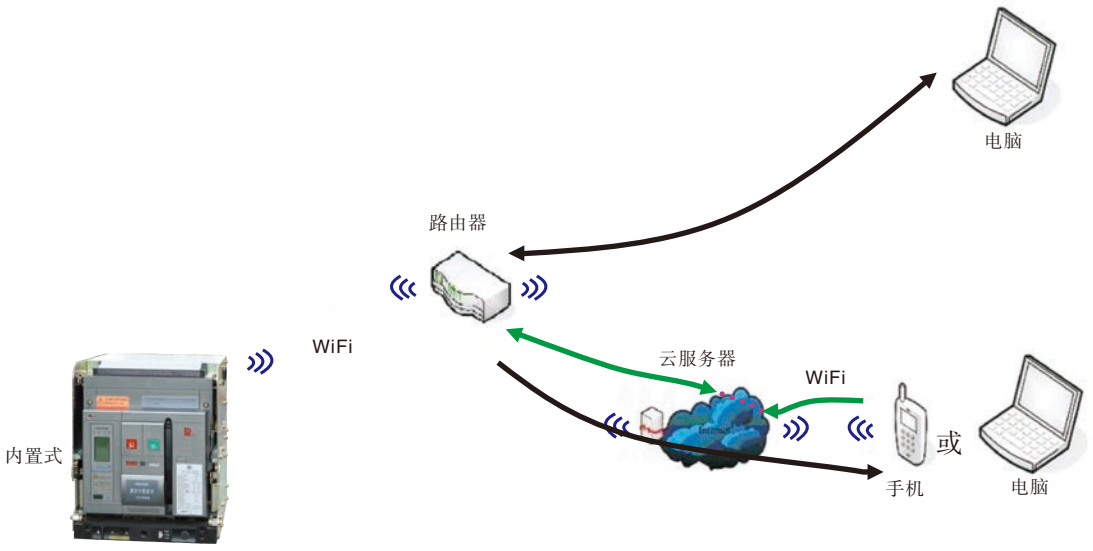
● 本体通信模块 Body's communicative module

通过选择通信协议即选择了本体通信模块，而不需另选其他附件即可实现Modbus、Profibus、Devicenet、CAN任一协议进行通信，实现四遥功能。

Selecting body's communicative module by selecting communicative protocol,don't selecting other accessories,can achieve any protocol for Modus,Profibus,Devicenet,CAN to communicate and four remoting funcation.

● WiFi通信模块 WiFi communicative module

内置WiFi通信模块通过WiFi无线信号下连路由器组建无线局域网模式或连接互联网组建云服务模式。用户可通过WiFi无线方式远程监测断路器运行状态和参数，并可在局域网模式下实现四遥功能，在云服务模式下实现遥测、遥信功能。




● 抽屉座通信模块组件 Components of draw-out socket communication module

抽屉座通信模块基于Modbus-RTU通信协议，可通过CN1DP通信适配器应用于Profibus、Devicenet、CAN总线，抽屉座通信模块组件由断路器外部的抽屉座通信模块和内部的抽屉座通信部件两部分组成。抽屉座通信部件安装于抽屉座内，提供抽屉式断路器本体与抽屉座处于“分离”、“试验”、“连接”三位置状态通信信号；抽屉座通信模块卡装于成套柜内35mm标准导轨上，提供读写断路器地址功能，显示断路器本体与抽屉座三位置状态指示等。两部分用软导线联结。

Draw-out socket communicative module based on Modbus-RTU communicative protocol,used to Profibus,Devicenet,CAN bus through CN1DP adapter,The components of draw-out socket communication module consist of external draw-out socket communication module and internal draw-out socket communication parts. The draw-out socket communication parts are installed inside the draw-out socket to provide the status signals of such three positions as "separated", "test" and "connected" of the main body of the draw-out circuit breaker and the draw-out socket. The draw-out socket communication module which can provide the function of reading the address of the circuit breaker and display the status indication of the main body and three positions of the draw-out socket etc. is installed by getting stuck into the standard guide way with 35mm in width inside the switchgear cabinet. The two parts of the draw-out socket communication module are connected with soft conducting lines.


| 型号 Type | 配用断路器 Fitting breaker |
|---|---|
| FCT/W2 | CW3V-2000/3200 |

## 附件 ACCESSORIES

● 合闸准备就绪信号 Ready-for-close signal

通过上位机可获得指示断路器可以准备合闸状态的信息。

You can get the information through the up-level device that the circuit breaker is ready for close.

| 型号 Type | 配用断路器 Fitting breaker |
|---|---|
| FHX/W325 | CW3V-2000/3200 |

● 欠电压信号 Under-voltage signal

通过上位机可获得断路器欠电压脱扣状态信息。

You can get the information through the up-level device that the circuit breaker is tripping under voltage.

| 型号 Type | 配用断路器 Fitting breaker |
|---|---|
| FQX/W3 | CW3V-2000/3200 |

● 故障脱扣信号 Faulty tripping signal

通过上位机可获得断路器由于线路或设备过载、短路或接地等保护跳闸状态信息。

You can get the information through the up-level device that the circuit breaker is tripping because of overload, short circuit or earth protection of the connection and devices.

| 型号 Type | 配用断路器 Fitting breaker |
|---|---|
| FGT/W3 | CW3V-2000/3200 |

● 储能信号 Charging signal

通过上位机可获得断路器电动操作机构“贮能”、“释能”状态信息。

You can get the information of charging or discharging of motor driven operating mechanism through the up-level device.

| 型号 Type | 配用断路器 Fitting breaker |
|---|---|
| FNX/W325 | CW3V-2000/3200 |

## 断路器功耗及降容系数 POWER LOSS AND DERATING COEFFICIENT

功耗（环境温度+40℃）

Power loss (environment temperature +40℃)

功耗是在断路器通以壳架电流Inm情况下测量的总的损耗。

Power loss is the overall consumption measured with the circuit breaker which is electrified with current Inm.

| 型号 Type | 三极/四极 功耗（W） Three/Four-poles power loss | |
|---|---|---|
| | 固定式 Fixed type | 抽屉式 Draw-out type |
| CW3V-2000 | 256 | 361 |
| CW3V-3200 | 440 | 837 |

## 断路器功耗及降容系数 POWER LOSS AND DERATING COEFFICIENT

降容系数 Derating coefficient

下表表示断路器在所处周围工作环境温度且满足GB/T14048.2中约定发热条件下持续承载电流的能力。
The following table shows continual current-loading capacity of circuit breakers at different ambient environment temperature and under the conditions of the satisfaction of conventional heating in GB/T14048.2.

| 型号 Type | 额定电流（A） | 周围工作环境温度℃ Ambient environment temperature | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | +40 | +45 | +50 | +55 | +60 | +65 | +70 |
| CW3V-2000 | 400 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 630 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 800 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 1000 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 1250 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 1600 | 1 | 1 | 1 | 1 | 1 | 1 | 0.94 |
| | 2000 | 1 | 1 | 1 | 1 | 1 | 0.94 | 0.89 |
| CW3V-3200 | 630 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 800 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 1000 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 1250 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 1600 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 2000 | 1 | 1 | 1 | 1 | 1 | 0.98 | 0.92 |
| | 2500 | 1 | 1 | 1 | 0.98 | 0.93 | 0.88 | 0.83 |
| | 2900 | 1 | 1 | 1 | 0.99 | 0.94 | 0.89 | 0.84 |
| | 3200 | 1 | 1 | 1 | 0.97 | 0.93 | 0.88 | 0.83 |

注:1、表中参数仅作为一般选型指导，鉴于开关柜形式和使用条件的多样性，实际应用中不同的解决方案必须进行试验验证。
2、表中参数是基于推荐接线铜排规格参考表，断路器主回路接线端子温度为120℃。

1、Parameter listed in the table is only for ordinary select guide, since switchgears have various forms and use condition, different soulutions in real applications must be tested before.
2、Parameter listed in table is based on the recommended wiring copper bus bar, and wiring terminal temperature of breaker's main circuit is 120℃.

## 高海拔降容 ALTITUDE DERATING

海拔超过适用工作环境的2000m，断路器电气性能可参照下表修正：
If altitude exceeds work environment for 2000m the electric property of circuit breaker can be corrected according to the following table.

| 海拔(m) Altitude | | 2000 | 3000 | 4000 | 4500 | 5000 |
|---|---|---|---|---|---|---|
| 工频耐压(V) Power-frequency withstand voltage | | 3500 | 3500 | 3000 | 2500 | 2200 |
| 最大额定工作电压（V） | | 1140 | 1140 | 1140 | 1140 | 1140 |
| 工作电流修正系数 Correction factor of operational current | CW3V-2000 | 1 | 1 | 1 | 1 | 0.97 |
| | CW3V-3200 | 1 | 0.93 | 0.88 | 0.85 | 0.82 |

## 断路器主回路接线铜排规格参照表 ROFERENCE TABLE OF MAIN CIRCUIT WIRING COOPER BAR FOR CIRCUIT BREAKERS

| 壳架等级额定电流Inm(A)<br>frame size rated current | 额定电流In(A)<br>Rated current | 铜排规格 Specification of cooper bars | |
|---|---|---|---|
| | | 根数 Number | 尺寸(mm × mm) Size |
| 2000 | 400 | 1 | 50 × 5 |
| | 630 | 2 | 50 × 5 |
| | 800 | 2 | 60 × 5 |
| | 1000 | 2 | 60 × 5 |
| | 1250 | 3 | 60 × 5 |
| | 1600 | 2 | 60 × 10 |
| | 2000 | 3 | 60 × 10 |
| 3200 | 630 | 2 | 50 × 5 |
| | 800 | 2 | 60 × 5 |
| | 1000 | 2 | 60 × 5 |
| | 1250 | 3 | 60 × 5 |
| | 1600 | 2 | 60 × 10 |
| | 2000 | 3 | 60 × 10 |
| | 2500 | 4 | 100 × 10 |
| | 2900 | 3 | 100 × 10 |
| | 3200 | 4 | 100 × 10 |

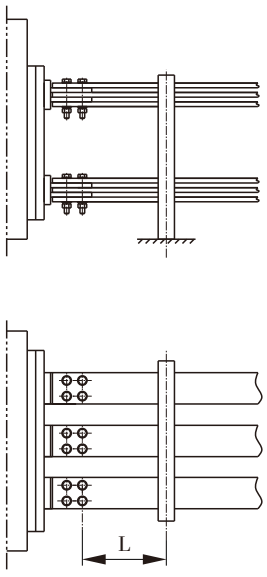
表中规格为断路器处于周围环境温度最高40℃，敞开安装且满足GB/T14048.2中约定发热条件。
The specification of cooper bars in the above table are introduced under the conditions that the circuit breakers open installed are at the maximum ambient environment temperature of 40℃ and satisfy conventional heating in GB/T14048.2.

## 主回路端子至外接铜排支架最大允许距离参考表
## MAX.DISTANCE REFERENCE TABLE OF BREAKER'S TERMINALS TO EXTERNAL COPPER BAR HOLDER

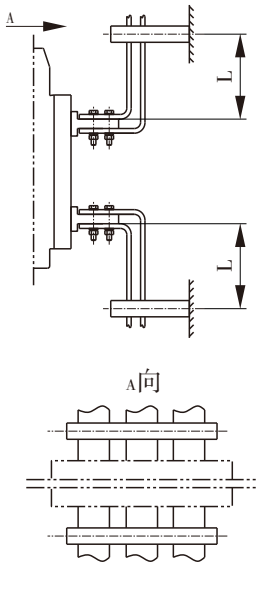
| 主电路端子至母线支架的最大允许距离 Max. Distance Of Main Circuit Terminals To Copper Bar Holder | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 短路电流（kA）<br>Short Circuit Current | | 42 | 55 | 65 | 85 | 100 | 120 | 135 |
| L（mm） | CW3V–2000 | 300 | 200 | 150 | — | — | — | — |
| | CW3V–3200 | 350 | 250 | 150 | 100 | — | — | — |

水平接线
Horizontally Wire

情形1

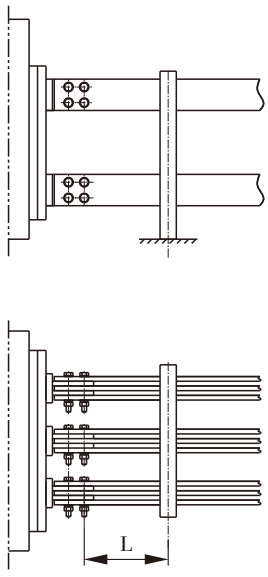



情形2

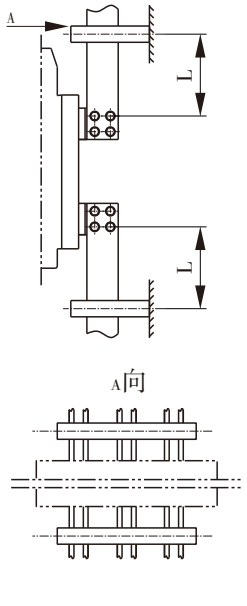



垂直接线
Vertically Wire

情形1




情形2



自动电源转换系统可以实现两路AC400V电源之间或两进线一母联或三电源AC400V电源之间的转换，确保用户可靠供电。自动电源转换系统由自动转换控制器和转接器及控制电缆（厂方已提供）组成，同时可与机械联锁配合使用。当实现手动并联转换时，则不应机械联锁。自动转换控制器安装于开关柜门板上，转接器安装于开关柜安装板上，控制器至转接器/转接器至断路器电缆长度标准配置为：两路电源转换1.8 m /1.8 m , 两进线一母联2 m /1.8m（超过标准配置电缆长度用户订货时应注明）。

Automatic power supply switch system guarantees reliable power supply for users by providing AC400V two lines or two incoming one bus conple of power supply or three supply alternatively.It consists automatic transfer controller,switching unit and cables (already prepared by the manufacture).The system may be used together with the mechanical interlock.But mechanical interlock can, t be used when manual in parallel transfer is used.the switching unit is mounted on the mounting plate of switchboard while the controller is mounted on the panel door of the switchboard.the cable standard length of controller to switching unit and switching unit to breaker is 1.8m/1.8m for tow supply transfer or 2m/1.8m for two incoming one bus conple(user should make special order when they require for the length mor than standard).

## ● FZZ两路电源转换　FZZ two supply transfer

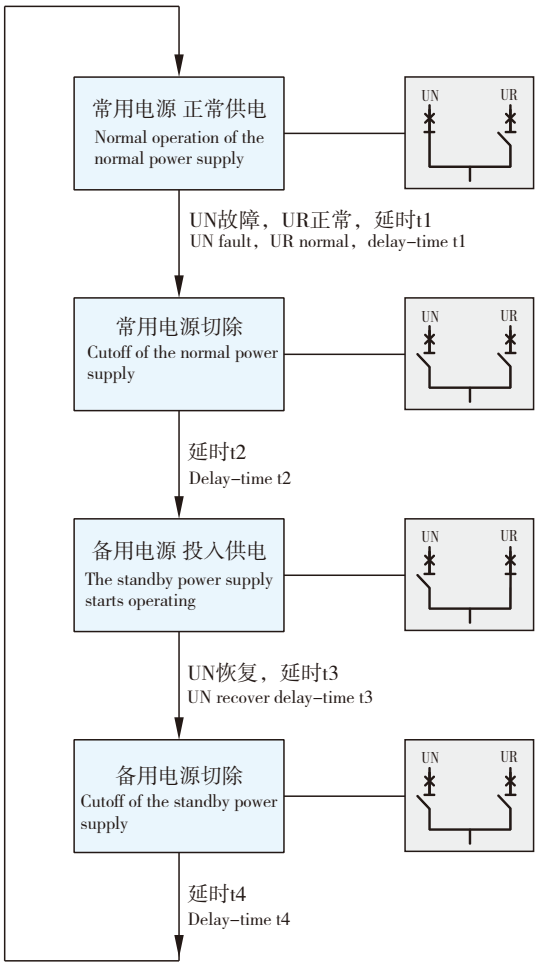
### ▲功能汇总　function summary

| 自动转换控制器型号<br>Automatic transfer controller type | 电子型R、S、F<br>Electronic | 智能型ZR、ZS、ZF intelligent<br>智能可通信ZTR、ZTS、ZTF<br>intelligent communicative |
|---|---|---|
| 自动转换控制器示意<br>Automatic transfer controller indication |  |  |
| 转接器示意<br>Adapter indication |  |  |
| 监测<br>Monitor | 对常用电源各相电压、备用（或发电）电源A相电压进行检测，若被检测相发生过电压、欠电压、失压则动作<br>Check the phase voltage of normal power supply and standby (or generator) power supply | |
| 自动转换<br>Automatic transfer | R、ZR、ZTR：常用备用电源间的自投自复<br>Automatic charge and automatic recovery between normal power supply and standby power supply<br>S、ZS、ZTS：常用备用电源间的自投不自复（互为备用）<br>Automatic charge and not automatic recovery between normal power supply and standby power supply (alterater each other)<br>F、ZF、ZTF：常用发电电源间的自投自复<br>Automatic charge and automatic recovery between normal power supply and generator | |
| 强制转换<br>Forced transfer | 强制常用、强制备用、强制断开<br>Forced to normal，forced to standby，forced to disconnected | |
| 复位操作<br>Reset operation | 按钮复位　Reset button | |
| 试验功能<br>Test function | 由强制转换功能实现　Implemented by forced transfer function | |
| 手动转换<br>Manual transfer | 手动常用、手动备用、手动断开　Manual to normal，manual to standby，manual disconnect | |
| 发电控制<br>Generating control | F、ZF、ZTF有此功能　Only for F、ZF、ZTF type | |
| 负荷卸载<br>Load uninstall | F有此功能　Only for F type | |
| 显示方式<br>Display mode | LED指示：常备用电源状态，常备用断路器合、分及脱扣状态，操作模式<br>LED indicator: condition of normal/standby power supply,close, open or tripped condition and operationg mode of normal/standby breaker | （1）LCD指示：常备用电源状态，常备用断路器合、分状态及脱扣状态，参数设定，动作记录<br>LCD indication:condition of normal/standby power supply ,close、open and tripped condition parameter setting, history of normal/standby breaker<br>（2）LED指示：常备用断路器合、分状态，操作模式<br>LED indication:close、open condition,operating mode of normal/standby breaker |
| 设置方式<br>Setting mode | 旋钮操作，可进行工作模式、延时时间等的设置<br>Set the working mode，delay time and others by knob | 按键操作、全中文菜单引导，可进行工作模式、欠压动作值、延时时间、通信参数等的设置<br>All chinese menu guide、set the working mode、undervoltage operation value、delay time communication parameter and others by keyboard |
| 参数设定<br>Parameter setting | 欠压：75% Us　过压：115%Us　失压：30%Us<br>Under voltage：75% Us　Overvoltage：115%Us　Voltage loss：30%Us | 欠压：（75%~85%）Us用户可调　过压：115%Us<br>失压：30%Us<br>Under voltage：（75%~85%）User adjustable　Overvoltage：115%Us<br>Voltage loss：30%Us |
| 通信功能<br>Communication | | 实现遥调、遥测、遥控、遥信。RS485通信接口，Modbus-RTU协议。<br>Tele-control,tele-communication,tele-adjustment,tele-detection, RS485 communication interface,, Modbus-RTU protocol |

| 延时时间（s）Delaytime ＼ 控制器型号 Controller type | R、ZR、ZTR、S、ZS、ZTS | F、ZF、ZTF |
|---|---|---|
| 转换断开延时时间t1 Transfer disconnection | 0.5~64 | 0.5~64 |
| 转换接通延时时间t2 Transfer colsing | 0.5 | 0.5~64 |
| 返回断开延时时间t3 Return disconnection | 0.5~64 | 0.5~240 |
| 返回接通延时时间t4 Return closing | 0.5 | 0.5~64 |
| 发电指令延时时间t5 Generating indication | | 1~180 |
| 发电停机指令延时时间t6 Generating stop indication | | 32~600 |

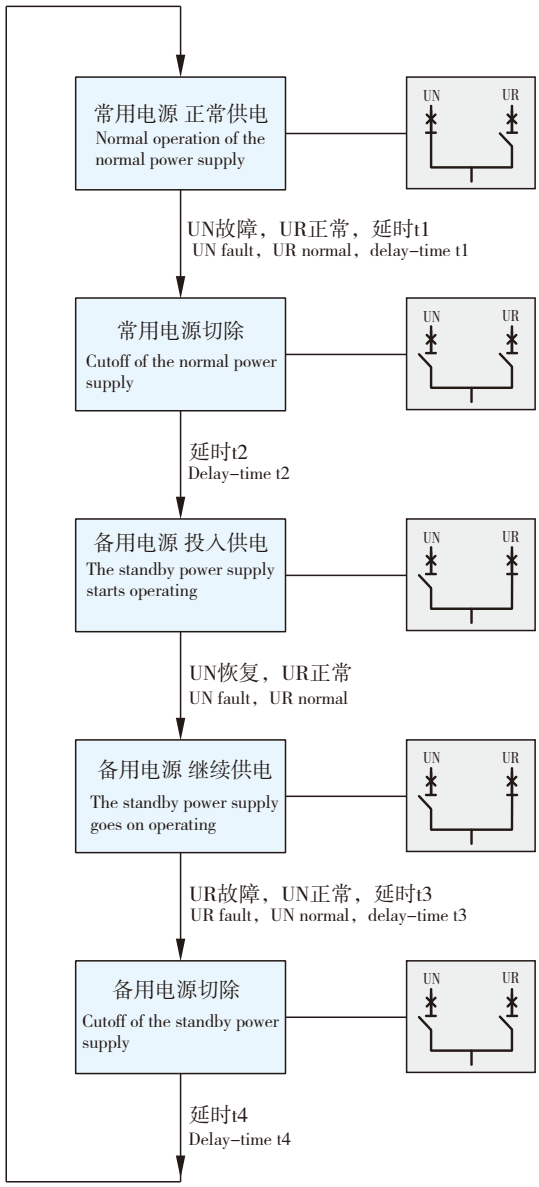
▲R、ZR、ZTR型--常用-备用间的自投自复

Automatic change and automatic recovery between normal and standby supply



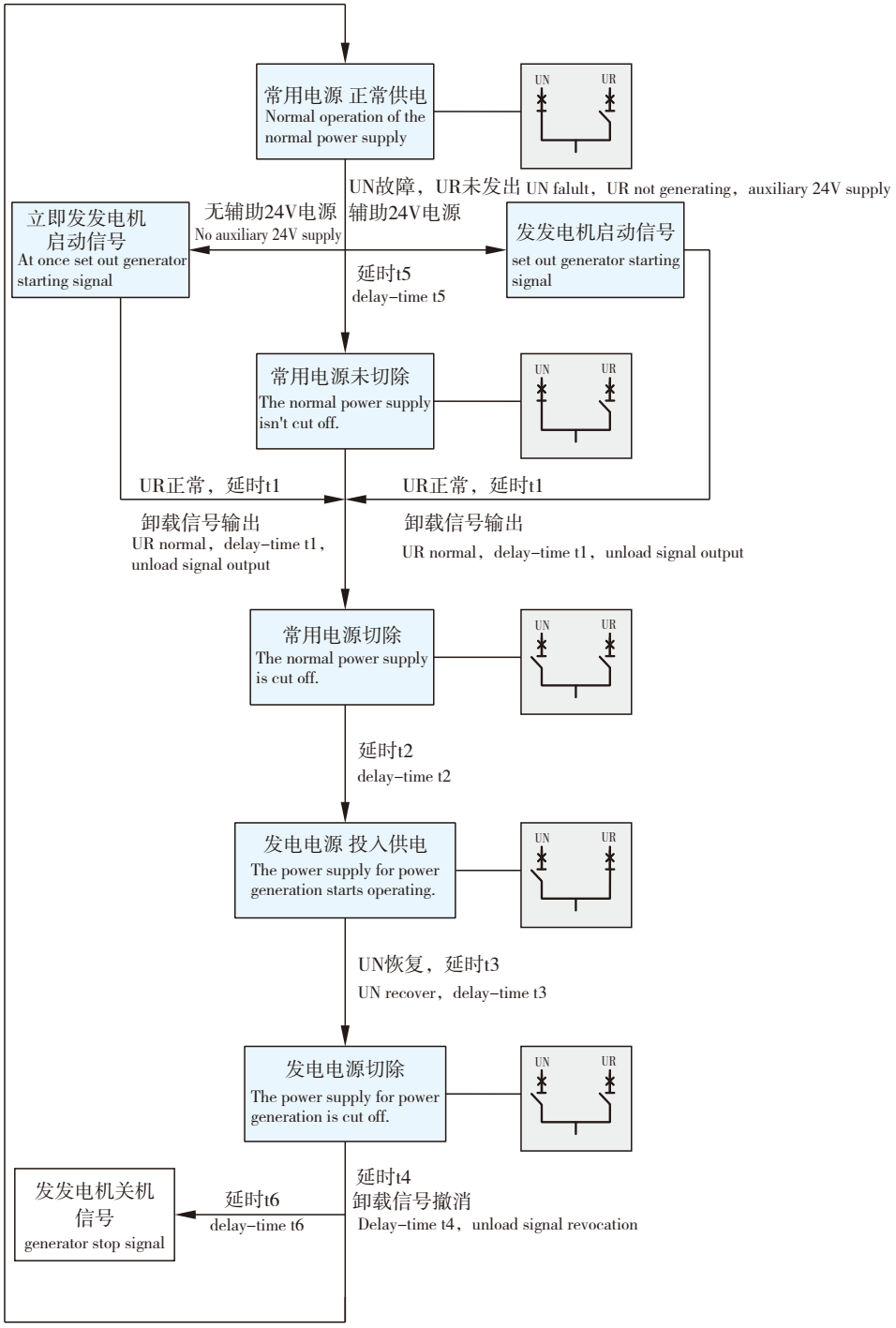

▲S、ZS、ZTS型--常用-备用间的自投不自复

Automatic change and not automatic recover between normal and standby supply



## ▲F、ZF、ZTF型--常用-发电电源间的自投自复

Automatic change and automatic recovery between normal and generator supply

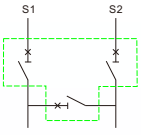
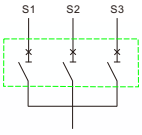



注：常用-发电型必须为控制器提供一个稳定、不间断的直流电源，直流电源电压对F型控制器为DC12V，对ZF、ZTF型控制器为DC24V，其容量不小于6W。当此直流电源缺失时，系统具有R型（自投自复型）的全部功能。

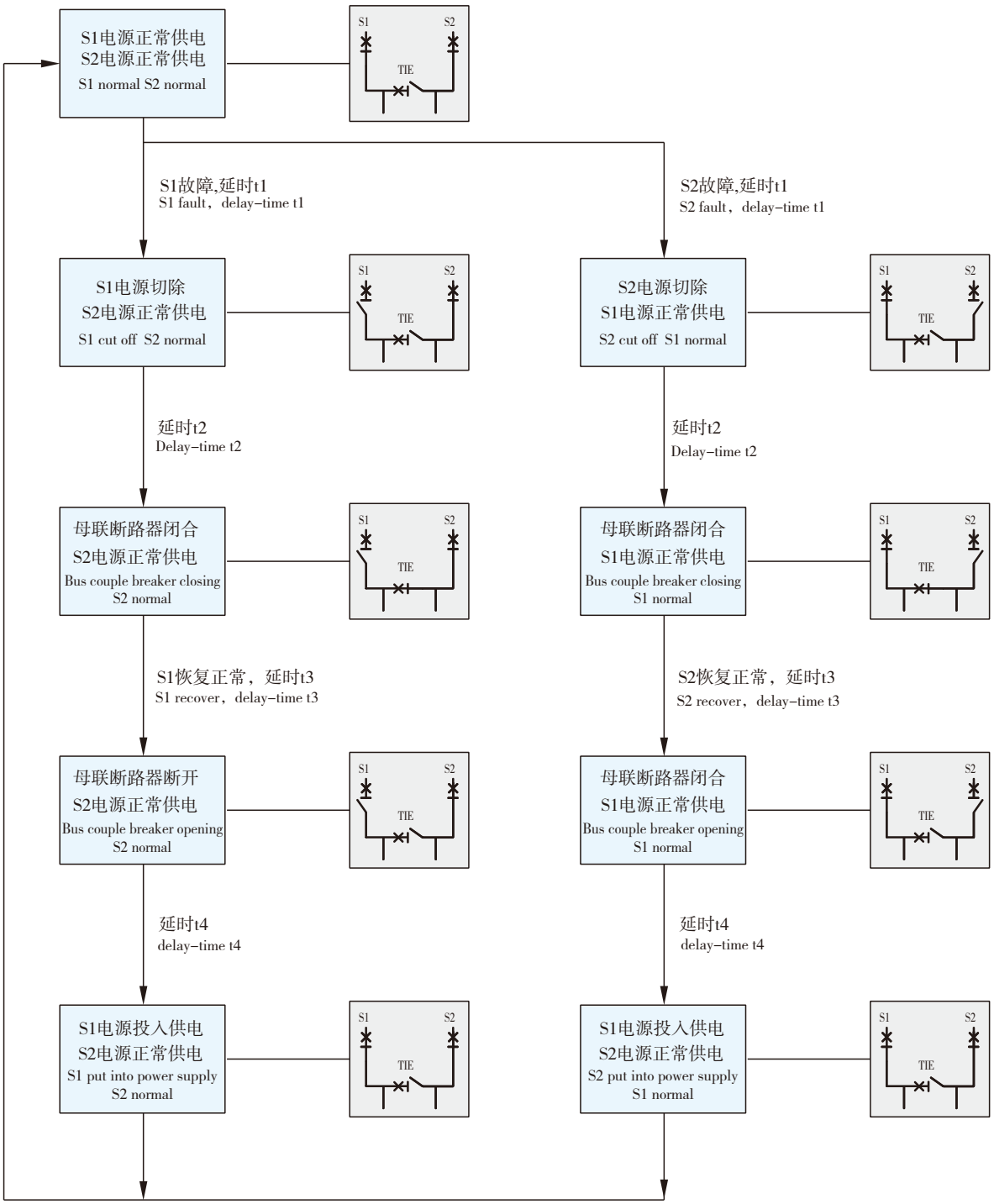
For the switch system used for normal power supply to power generation supply system,the controller should be supplied with a reliable and consecutive power supply of D.C. 12V (F type) or D.C.24V (ZF、ZTF type) and power capacity no less than 6W.If the D.C. supply is cut off,the switch system will has the function of automatic switch and restoration（type R）.

## ● FLZ两进线一母联电源转换及三电源转换 FLZ two incoming line one bus conple supply transfer and three supplys transfer

### ▲功能汇总 Function summary

| 自动电源转换系统型式 Automatic power supply switch system type | 两进线一母联电源转换 Two incoming line one bus conple supply transfer | | 三电源转换 Three supplys transfer |
|---|---|---|---|
| 主回路接线 Main circuit tie line |  | |  |
| 自动转换控制器型号 Automatic transfer controller type | 智能型WTT3 Intelligent | 智能型带并联转换WTB3 Intelligent with parallel | 智能型WTT5 Intelligent |
| 自动转换控制器示意 Automatic transfer controller indication |  |  |  |
| 转接器示意 Adapter indication |  |  |  |
| 监测 Monitor | 对常用（S1）、备用（S2）电源各相电压进行检测，若被检测相发生过电压、欠电压、失压则动作<br>Check the each phase voltage of normal, standby power supply.if there is overvoltage、undervoltage、voltageloss in the checker phase、transfer will operation | 对常用（S1）、备用（S2）电源各相电压进行检测，若被检测相发生过电压、欠电压、失压则动作；具有常、备用电源频率、电压差、频率差和相位差检测<br>Check the each phase voltage of normal,standby power supply.if there is overvoltage、undervoltage、voltageloss in the checker phase、transfer will operation.this type can check frequency,voltage difference,frequency difference and phase difference of mormal standby power supply. | 对S1、S2、S3三路电源各相电压进行检测，若被检测相发生过电压、欠电压、失压则动作。<br>Check the each phase voltage of S1，S2，S3 three supplys，if there is overvoltage，undervoltage，voltage loss in the checker phase，transfer will operation |
| 自动转换 Automatic transfer | 可设定自投自复或自投不自复<br>Automatic charge and automatic rerovery or automatic charge and not automatic recovery | | |
| 强制转换 Forced transfer | 强制常用、强制备用、强制断开 | | |
| 手动并联转换 Manual parallel transfer | —— | √ | —— |
| 复位操作 Reset operation | 按钮复位<br>Reset button | | |
| 试验功能 Test function | 由强制转换功能实现<br>Implemented by forced transfer function | | |
| 手动转换 Manual transfer | 由强制转换功能实现<br>Implemented by forced transfer function | | |
| 显示方式 Display mode | （1）LCD指示：常备用电源状态，常备用断路器合、分状态及脱扣状态，参数设定，动作记录<br>LCD indication: condition of normal/standby power supply, close、open and tripped condition, parameter setting history of normal/standby breaker<br>（2）LED指示：常备用电源状态，常备用断路器合、分及脱扣状态<br>LED indicator: condition of normal/standby power supply, close open or tripped condition and operationg mode of normal/standby breaker | （1）LCD指示：常备用电源状态，常备用断路器合、分状态及脱扣状态，参数设定，动作记录<br>LCD indication: condition of normal/standby power supply, close、open and tripped condition, parameter setting history of normal/standby breaker<br>（2）LED指示：常备用电源状态，常备用电源电压差、频率差、相位差状态，常备用断路器合、分及脱扣状态<br>LED indication: close, open condition, operating mode of normal/standby breaker. condition: voltage difference, frequencydifference, phase difference of normal/standby power supply | 1）LCD指示：三路电源状态，三路电源断路器合、分状态及脱扣状态，参数设定，动作记录<br>LCD indication: condition of three supplys, close、open and tripped condition, parameter setting history of three breaker.<br>（2）LED指示：三路电源状态，三路断路器合、分及脱扣状态<br>LED indication: condition of three supplys, close、open and tripped condidation. |
| 设置方式 Setting mode | 按键操作、全中文菜单引导，可进行工作模式、欠压动作值、延时时间、通信参数等的设置<br>All chinese menu guide、set the working mode、undervoltage operation value、delay time communication parameter and others by keyboard | | |
| 参数设定 Parameter setting | 欠压：（70%~90%）Us用户可调； 过压：（105%~120%）Us用户可调； 失压：30%Us，步长：5%<br>under voltage：（70%~90%）Us user adjustable； over voltage：（105%~120%）Us user adjustable； voltage loss：30%Us；step：5% | | |
| | 延时时间（s）Delay time：<br>电源断开延时时间t1 Disconnection of power supply 0.1~100<br>母联断路器接通延时时间t2 Closing of bus couple breaker 0.1~100<br>母联断路器断开延时时间t3 Disconnection of bus couple breaker 0.1~100<br>电源闭合延时时间t4 Closing of power supply 0.1~100<br>步长0.1s Time step（≤10s时），1s（>10s时） | 并联转换条件 Parallel transfer condition：<br>并联转换电压差ΔU（V）Voltage difference (0.02~0.12)Ue，步长：1V<br>并联转换频率差Δf（Hz）Frequency difference 0.1~1，步长：0.1Hz<br>并联转换相位差Δδ（°）Phase difference 5~20，步长：1<br>延时时间（s）Delay time：<br>电源断开延时时间t1 Disconnection of power supply 0.1~100<br>母联断路器接通延时时间t2 Closing of bus couple breaker 0.1~100<br>母联断路器断开延时时间t3 Disconnection of bus couple breaker 0.1~100<br>电源闭合延时时间t4 Closing of power supply 0.1~100<br>步长0.1s Time step（≤10s时），1s（>10s时） | 延时时间（s）Delay time：<br>S1电源断开延时时间t1 S1Disconnection of power supply 0.1~100<br>S1电源接通延时时间t2 S1Closing of bus couple breaker 0.1~100<br>S2电源断开延时时间t3 S2Disconnection of bus couple breaker 0.1~100<br>S2电源接通延时时间t4 S2Closing of bus couple breaker 0.1~100<br>S3电源断开延时时间t5 S3Disconnection of bus couple breaker 0.1~100<br>S3电源接通延时时间t6 S3Closing of bus couple breaker 0.1~100<br>发电起动延时时间t7 Generator starting delay-time 1~180<br>发电停止延时时间t8 Generator stop delay-time 1~180<br>步长0.1s Time step（≤10s时），1s（>10s时） |
| 通信功能 Communication | 实现遥调、遥测、遥控、遥信。RS485通信接口，Modbus-RTU协议。<br>Tele-control,tele-communication,tele-adjustment,tele-detection, RS485 communication interface,, Modbus-RTU protocol | | |

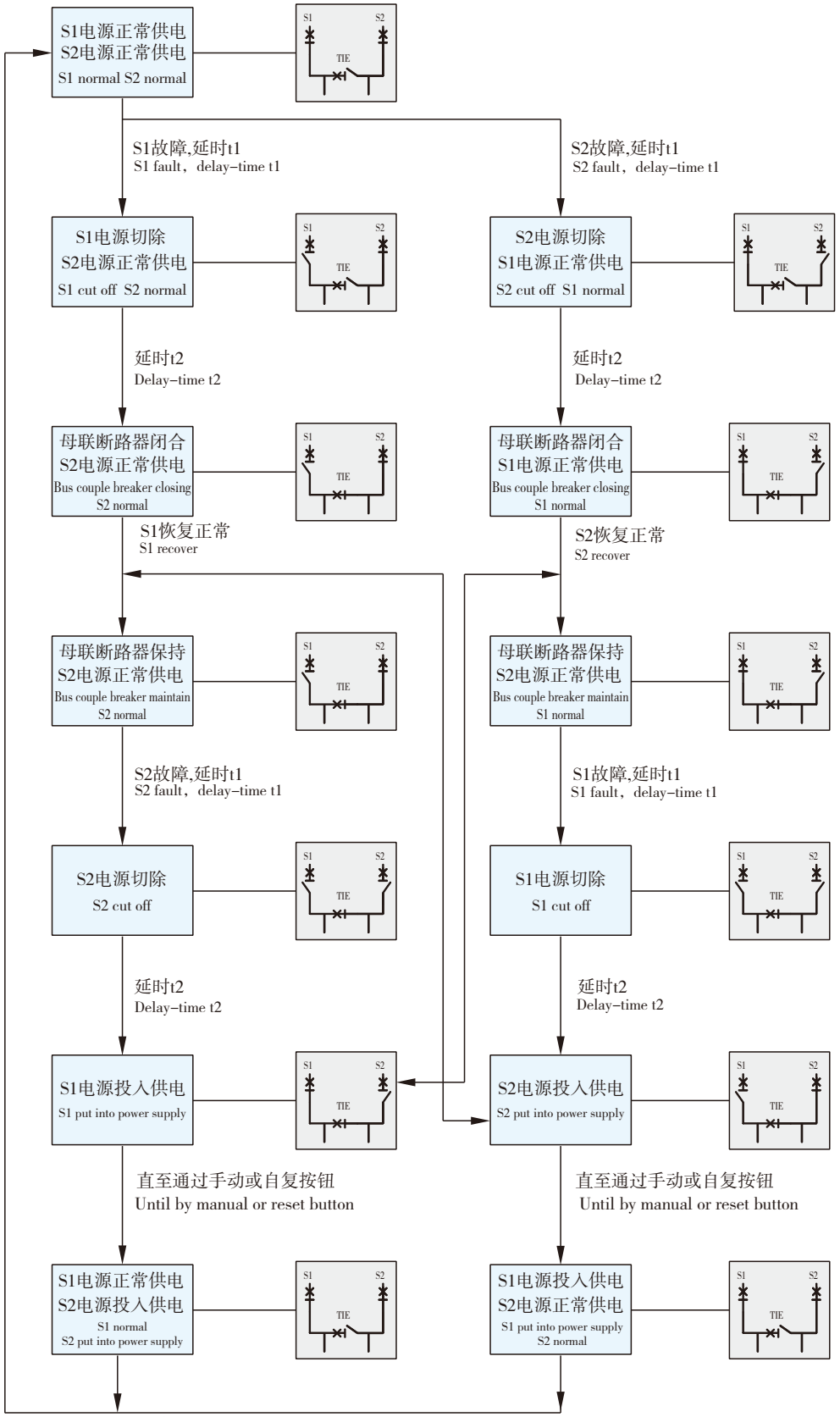
▲WTT3 、WTB3型--常用-备用间的自投自复
Automatic change and automatic recovery between normal and standby supply




注：TIE为母联断路器
Note: TIE-bus couple breaker.

▲WTT3 、WTB3型--常用-备用间的自投不自复

Automatic change and not automatic recover between normal and standby supply




注：TIE为母联断路器

Note: TIE-bus couple breaker.

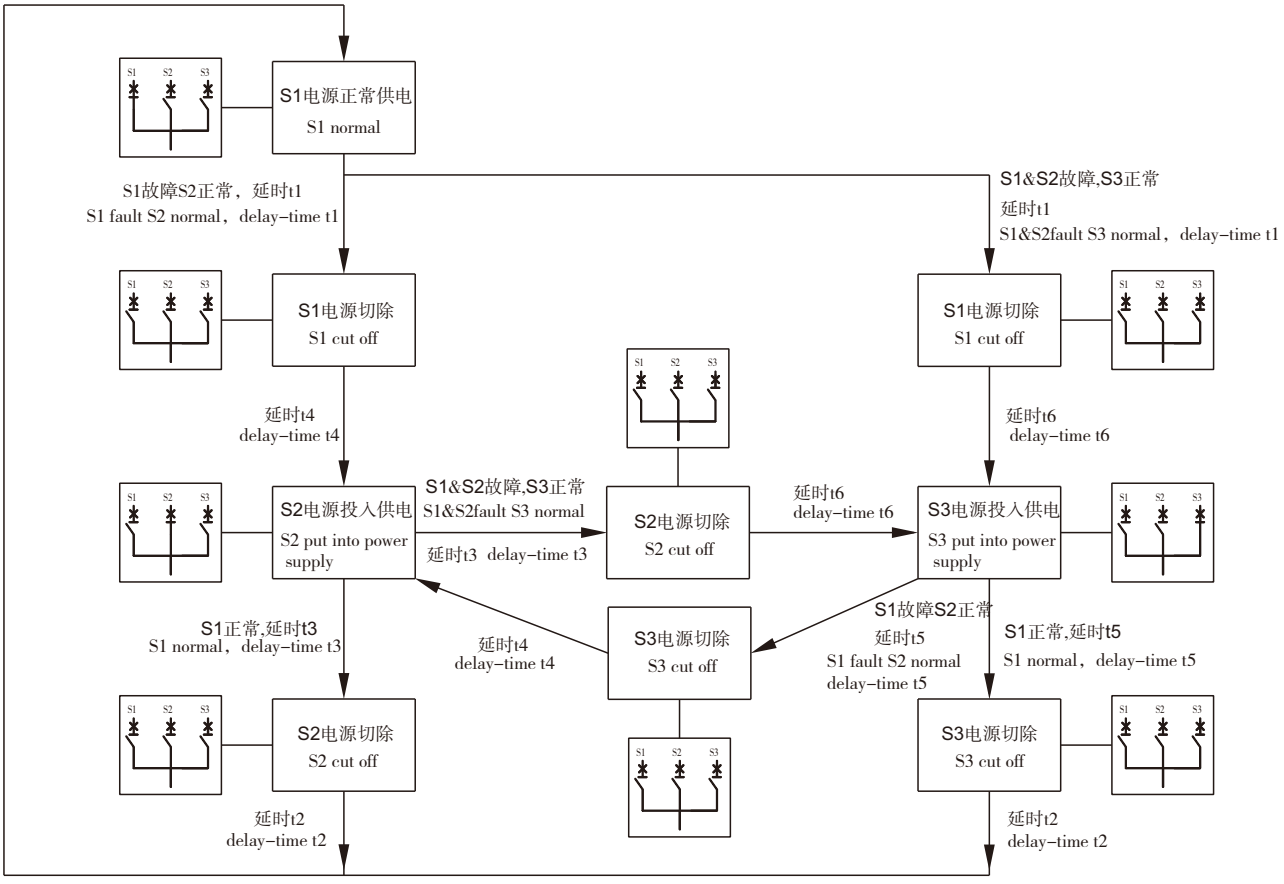
▲WTB3手动并联转换 WTB3 manual parallel transfer

WTB3控制器手动模式为并联转换切换，即动作方式为断路器先合后分，断路器同时闭合时间＜0.5s。并联模式可设定为“最佳”和“常规”两种模式，“最佳”是指控制器检测到常备用电源相序、电压差、频率差满足条件的前提下自动搜索接近于同相角的时刻进行并联合闸，以最大限度的降低合环电流；“常规”是指控制器检测到常备用电源相序、电压差、频率差满足条件的前提下检测到相角差满足设定的阈值即进行并联合闸。

WTB3 controller, s manul mode uses parattel conuersion switchover,that is ,circuit breaker, s operation metliiol is "first male,then meat",meanushilie,circuit breaker, s making time is less than 0.5s ,Parallelmode can be set with in "optimiztion" means when the controller detects the phase order voltage difference and treguency different .the preconditions ,it cuatornat.cally searches the time which approaches in phase angle and it operates parallet making to maxiumly rechue loop current; "Normal" means when the controller detects the phase order,voltage difference and frequency difference of backup power meet the meconditions and phase angle difference meets setting,it operates paralled meching.

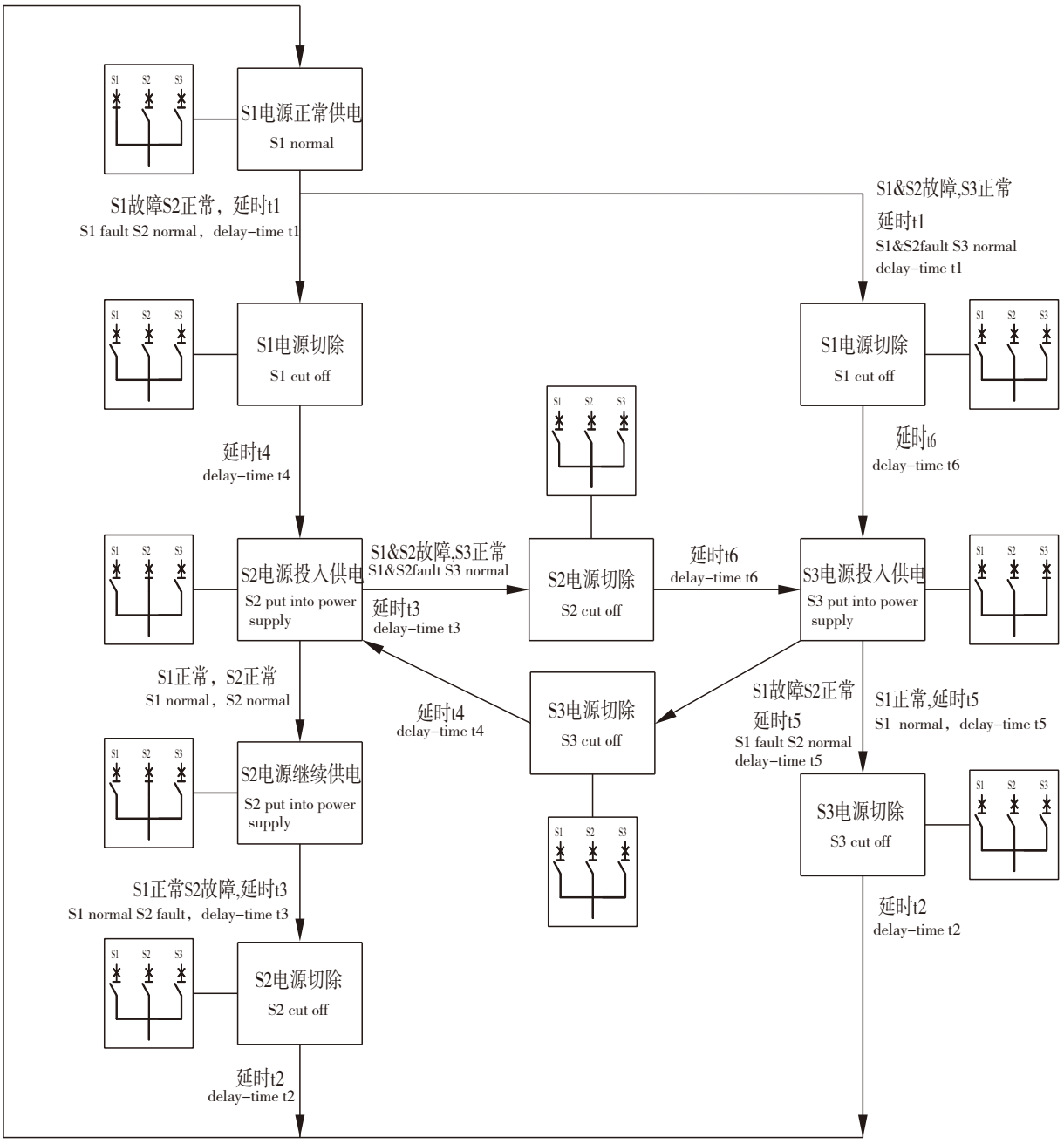
▲WTT5型--三电网电源自投自复

Automatic change and automatic recover between three network supplys



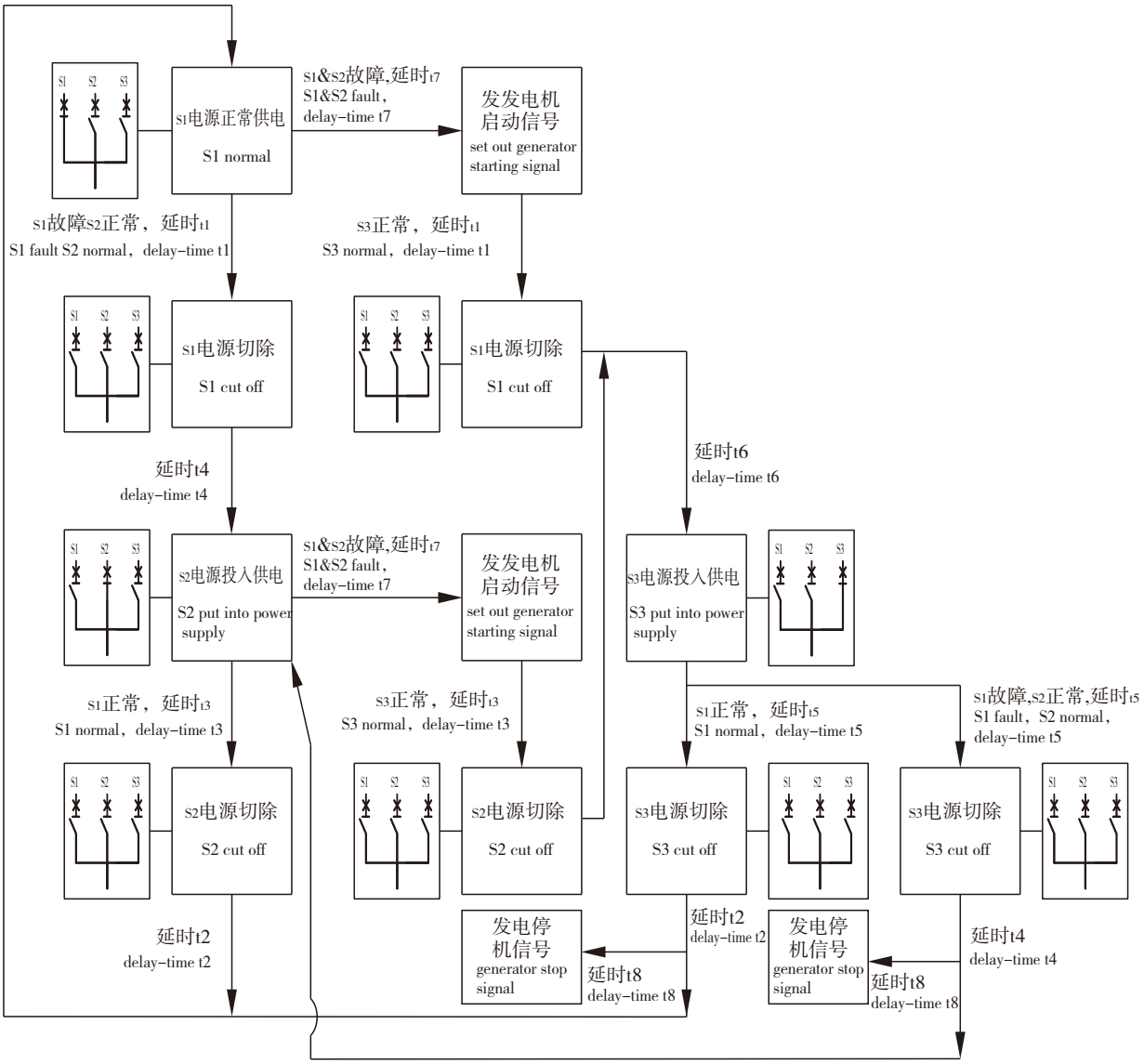
▲WTT5型--三电网电源自投不自复

Automatic change and not automatic recover between three network supplys



▲WTT5型--两个电网电源和一个发电电源自投自复

Automatic change and automatic recover between two network supplys with generating



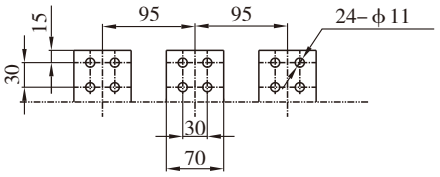

●特性 Characteristics

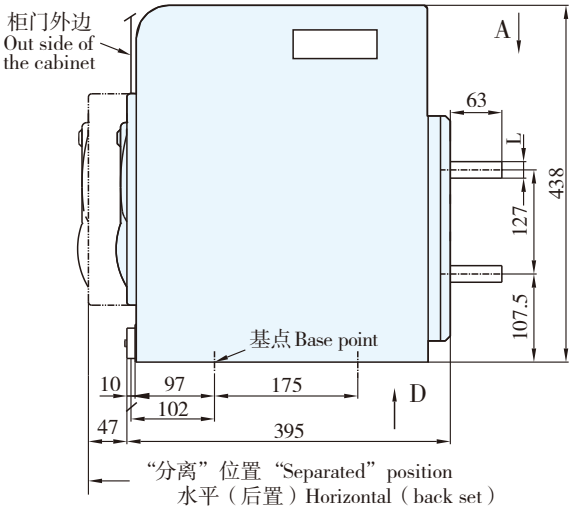
| 型 号<br>Type | 自动转换控制器型号<br>Automatic controller type | 配用断路器<br>Fitting breaker |
|---|---|---|
| FZZ两路电源转换<br>Two lines supply transfer | R、ZR、ZTR | CW3V-2000/3200 两台<br>（可配其它CW系列断路器） |
| | S、ZS、ZTS | |
| | F、ZF、ZTF | |
| FLZ两进线一母联电源转换<br>Two incoming one bus conple | WTT3 | CW3V-2000/3200 三台<br>（可配其它CW系列断路器） |
| | WTB3 | |
| FLZ三电源转换<br>Three supply transfer | WTT5 | CW3V-2000/3200 三台<br>（可配其它CW系列断路器） |

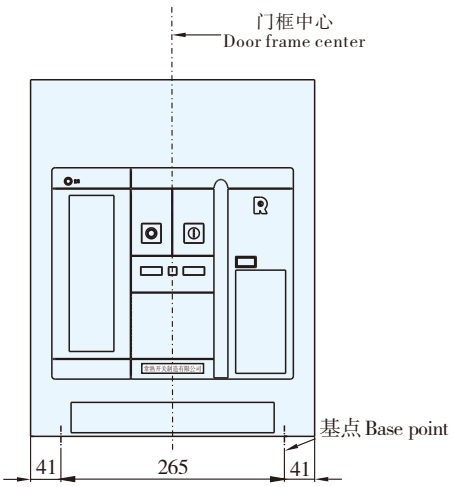
● CW3V-2000三极真空断路器（抽屉式）
Vacuum circuit-breaker with three poles(draw-out)

| 电流规格 Current specifications | L（mm） |
|---|---|
| 2000A | 20 |
| 400A~1600A | 15 |

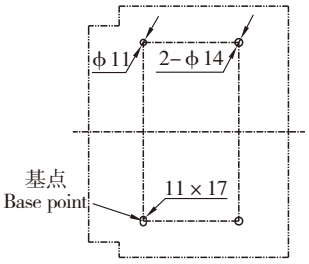
A向
Direction A

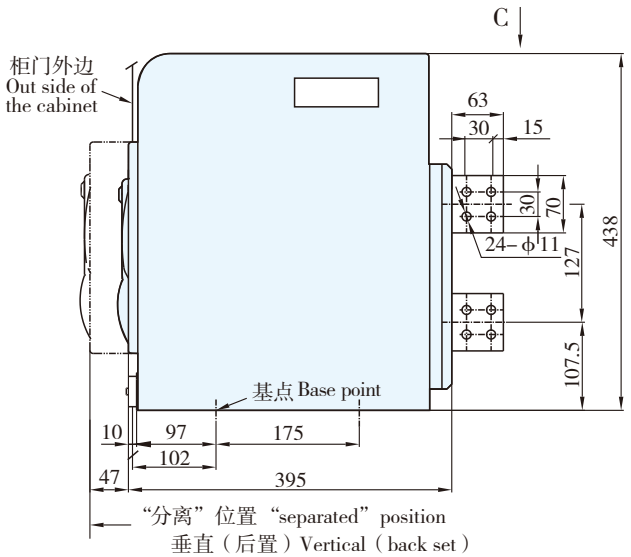


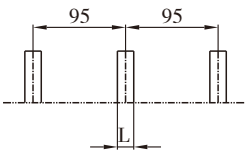




D向
Direction D



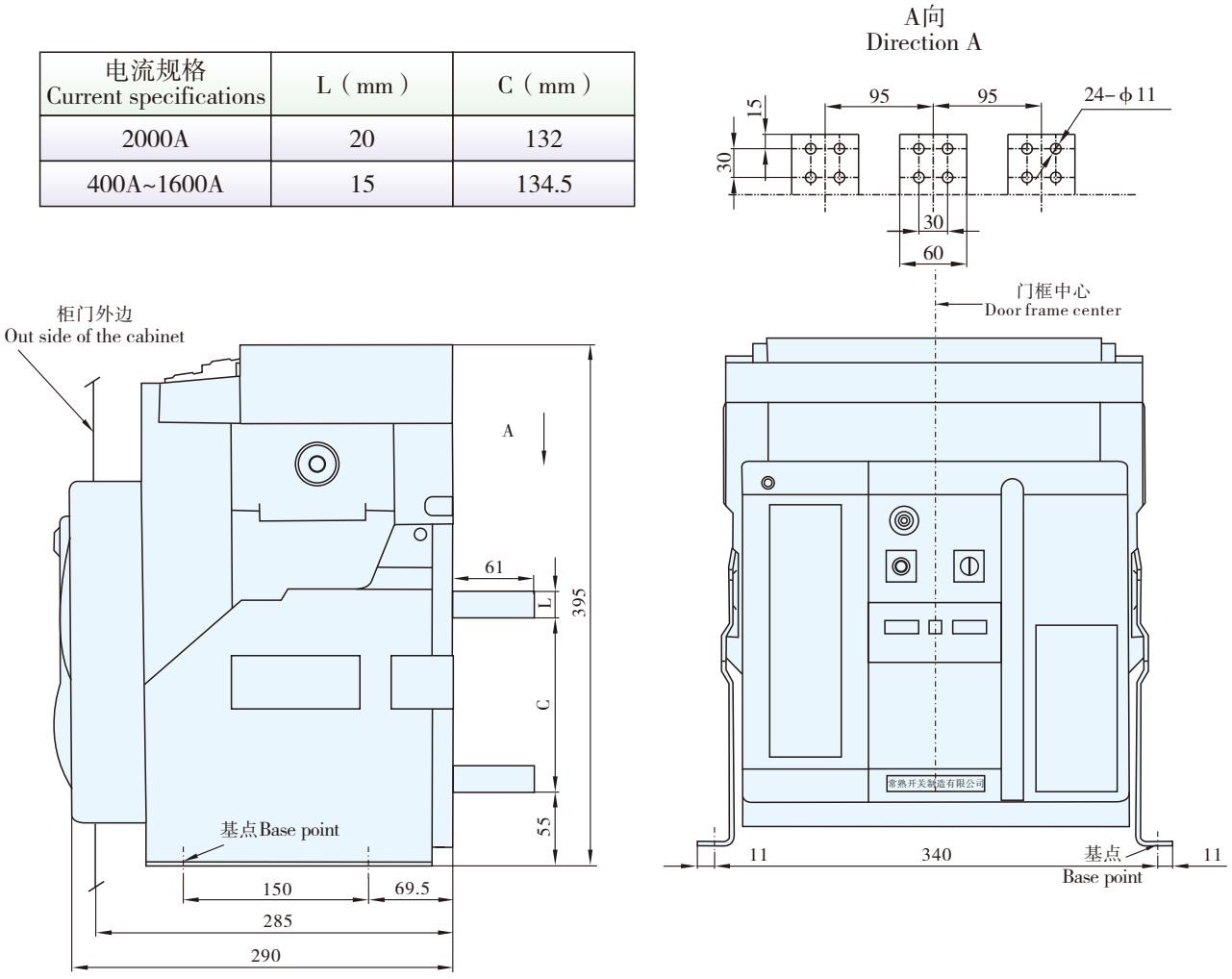




C向
Direction C

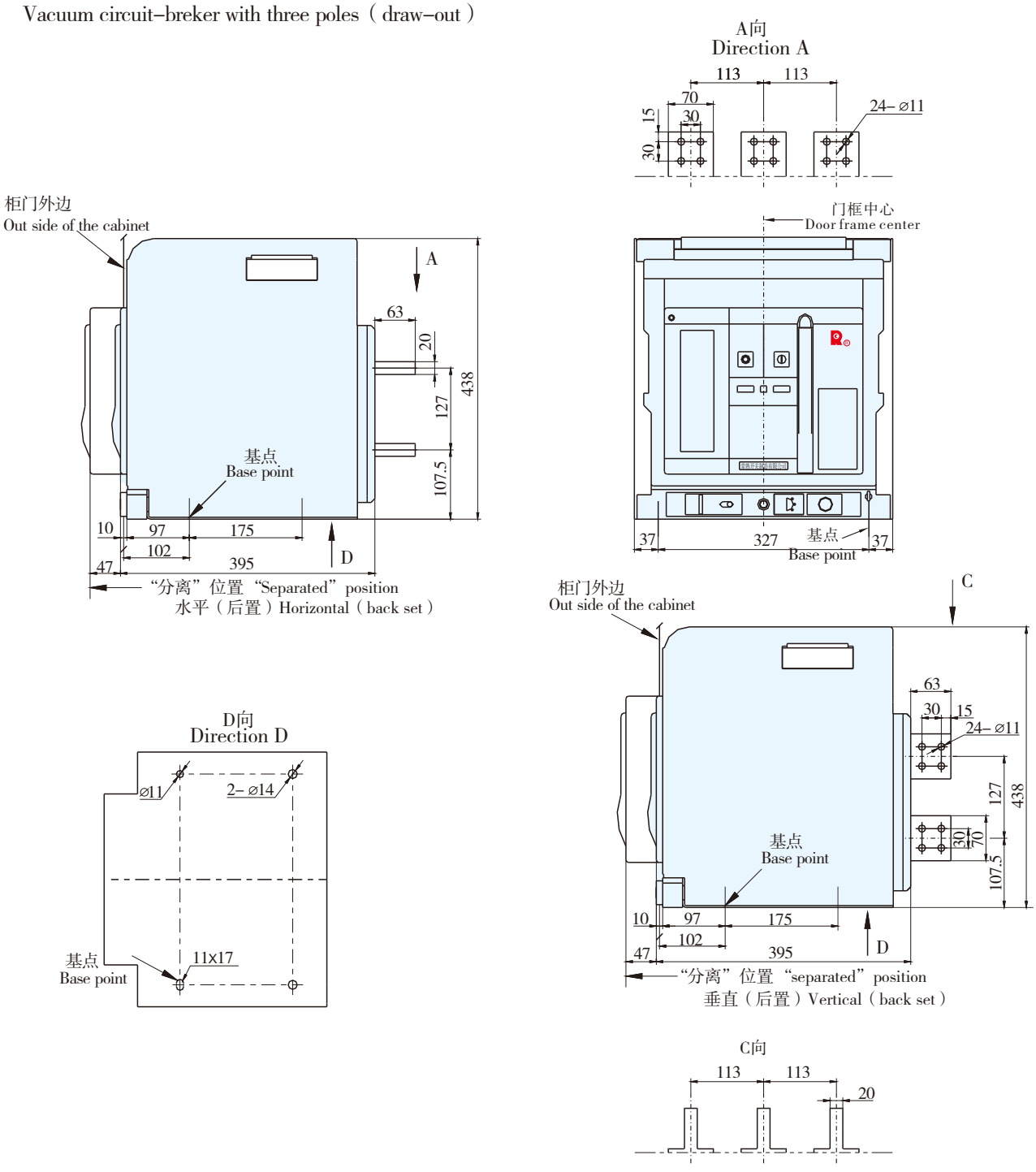


- CW3V-2000三极真空断路器（固定式）
  Vacuum circuit-breaker with three poles(fired type)

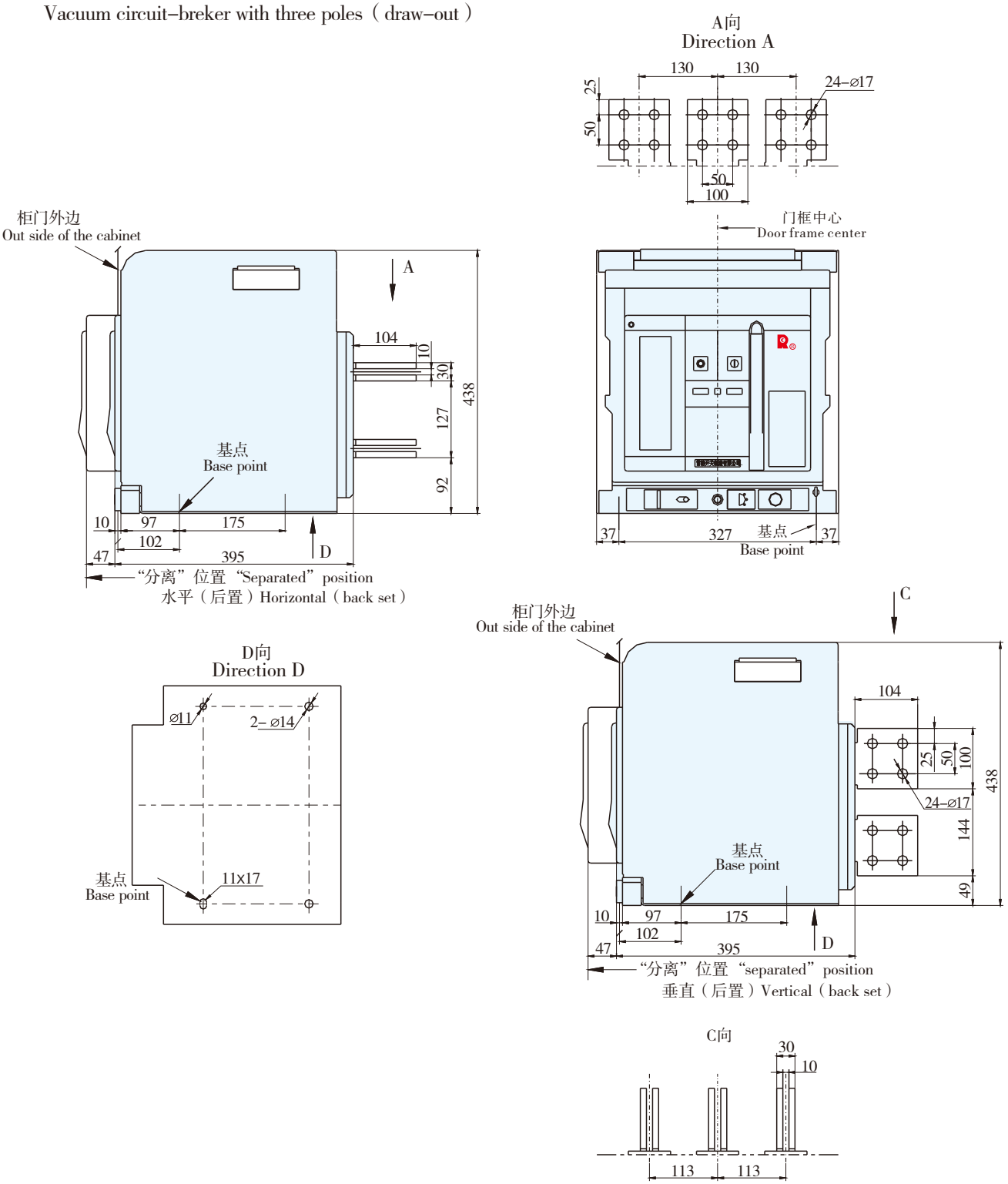
| 电流规格 Current specifications | L（mm） | C（mm） |
|---|---|---|
| 2000A | 20 | 132 |
| 400A~1600A | 15 | 134.5 |



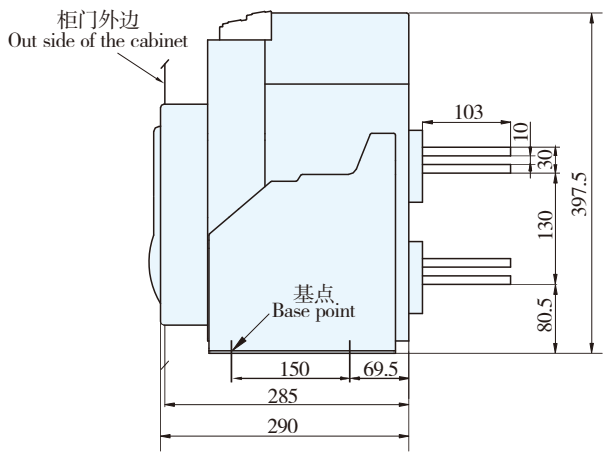
- CW3V–3200三极真空断路器（抽屉式），630A–1600A
  Vacuum circuit–breker with three poles（draw–out）

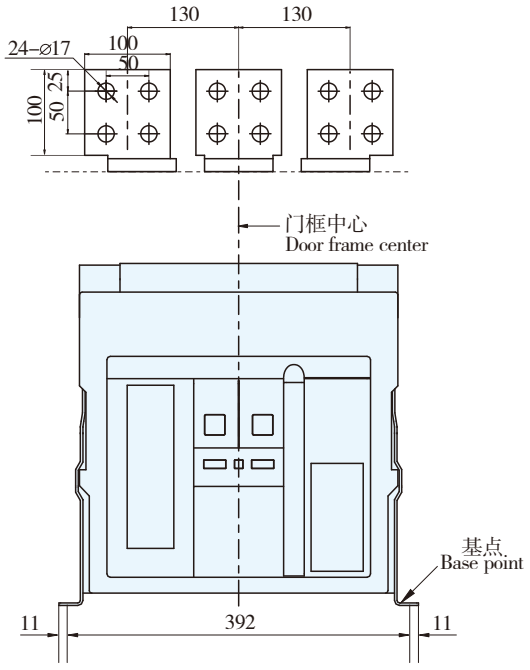


- CW3V-3200三极真空断路器（抽屉式），2000A-3200A
  Vacuum circuit-breker with three poles（draw-out）



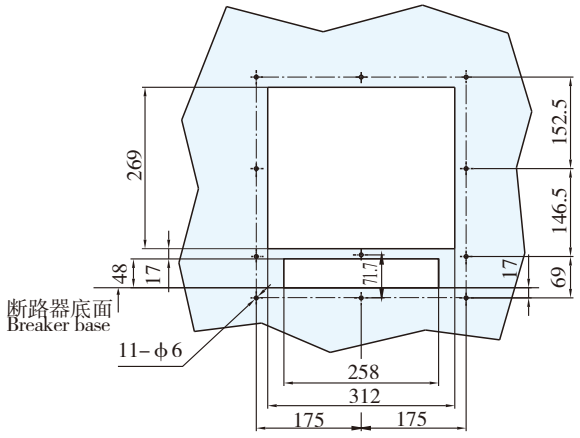
- CW3V–3200三极真空断路器（固定式）
  Vacuum circuit–breaker with three poles（fixed type）



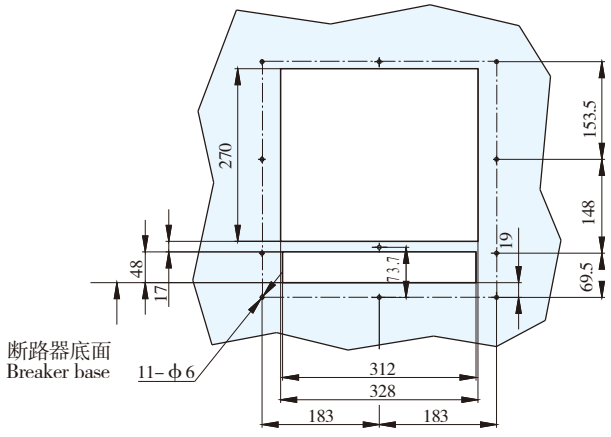



# 断路器门框开孔尺寸 CUT OUT DIEMENSIONS

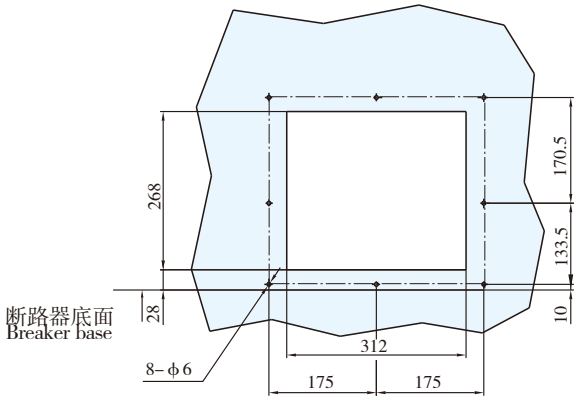
- CW3V-2000真空断路器（抽屉式）
  安装门框前盖开孔图
  控制面板中心离柜门右铰链最小距离为256mm
  Vacuum circuit-breaker(draw-out type)
  The drawing of cutout dimensions for mounting cover of doorframe
  Distance from the panel center of citcuit breaker it the righting of cabinet door should be least 256mm



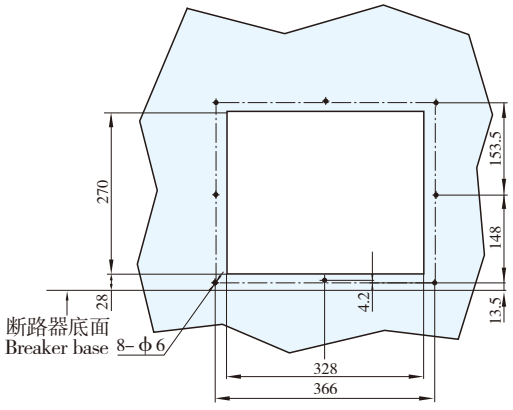

- CW3V-3200真空断路器（抽屉式）
  安装门框前盖配孔图
  控制面板中心离柜门右铰链最小距离为264mm
  Vacuum circuit-breaker(draw-out type)
  The drawing of cutout dimensions for mounting cover of doorframe
  Distance from the panel center of citcuit breaker it the righting of cabinet door should be least 264mm



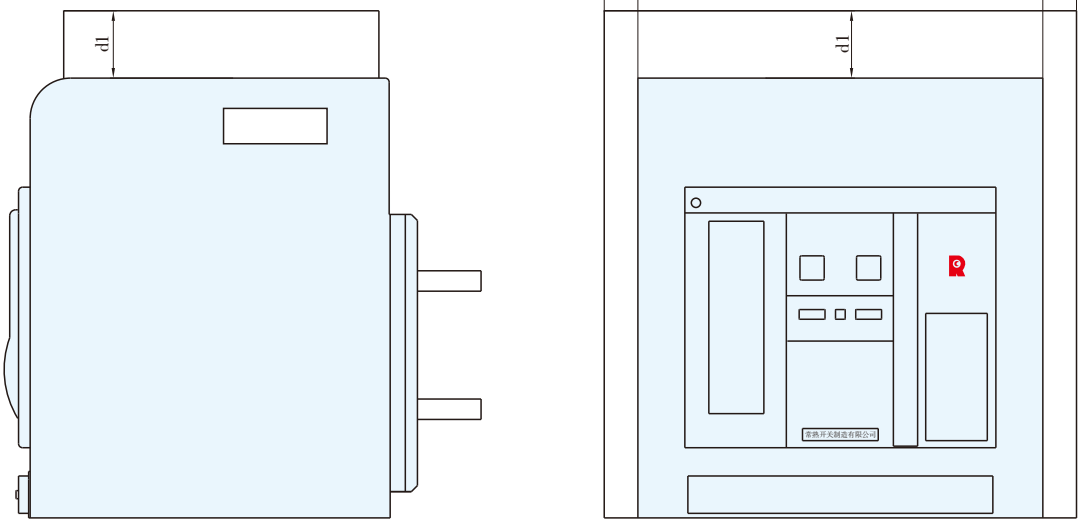

- CW3V-2000真空断路器（固定式）
  安装门框前盖开孔图
  控制面板中心离柜门右铰链最小距离为256mm
  Vacuum circuit-breaker(fixed type)
  The drawing of cutout dimensions for mounting cover of doorframe
  Distance from the panel center of citcuit breaker it the righting of cabinet door should be least 256mm




- CW3V-3200真空断路器（固定式）
  安装门框前盖开孔图
  控制面板中心离柜门右铰链最小距离为264mm
  Vacuum circuit-breaker(fixed type)
  The drawing of cutout dimensions for mounting cover of doorframe
  Distance from the panel center of citcuit breaker it the righting of cabinet door should be least 264mm



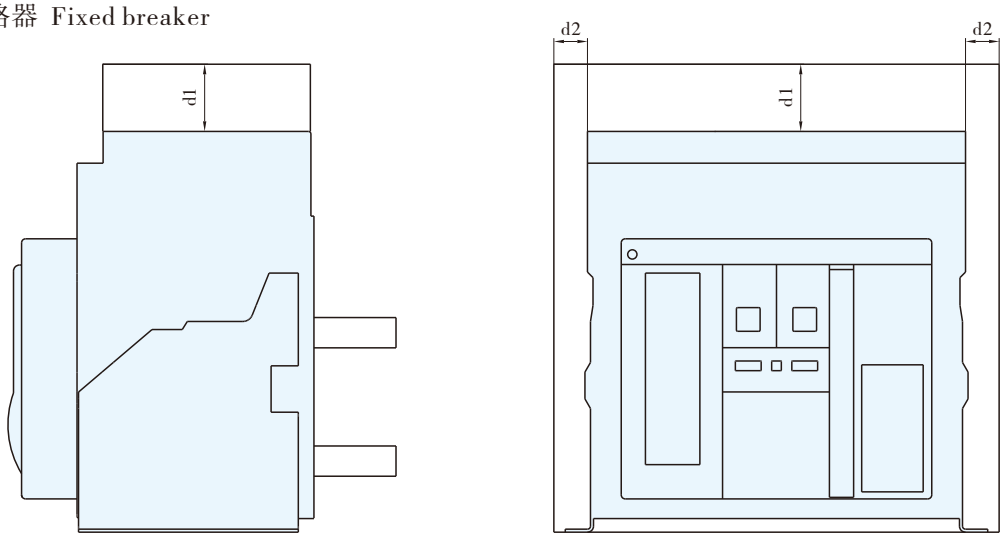
## ● 抽屉式断路器 Draw-out breaker




断路器与柜壁或带电部件最小距离
Minimn distance between breaker with switchboard wall or live part.

| | 柜壁 Switchboard wall | 带电部分 Live part |
|---|---|---|
| d1(注note)(mm) | 0 | 60 |
| d2(mm) | 0 | 60 |

## ● 固定式断路器 Fixed breaker

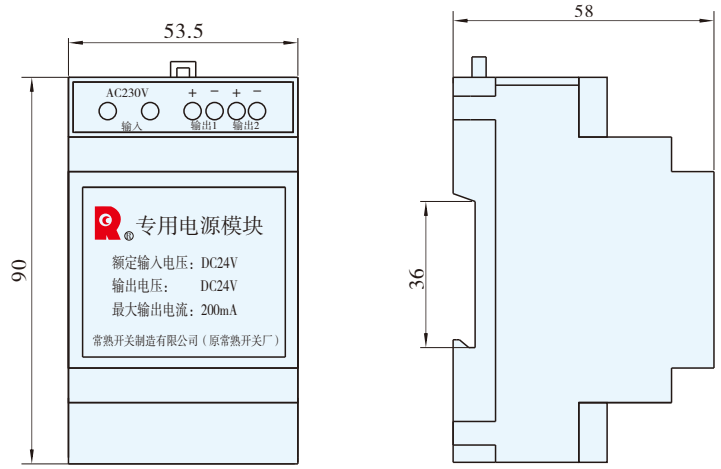



断路器与柜壁或带电部件最小距离
Minimn distance between breaker with switchboard wall or live part.

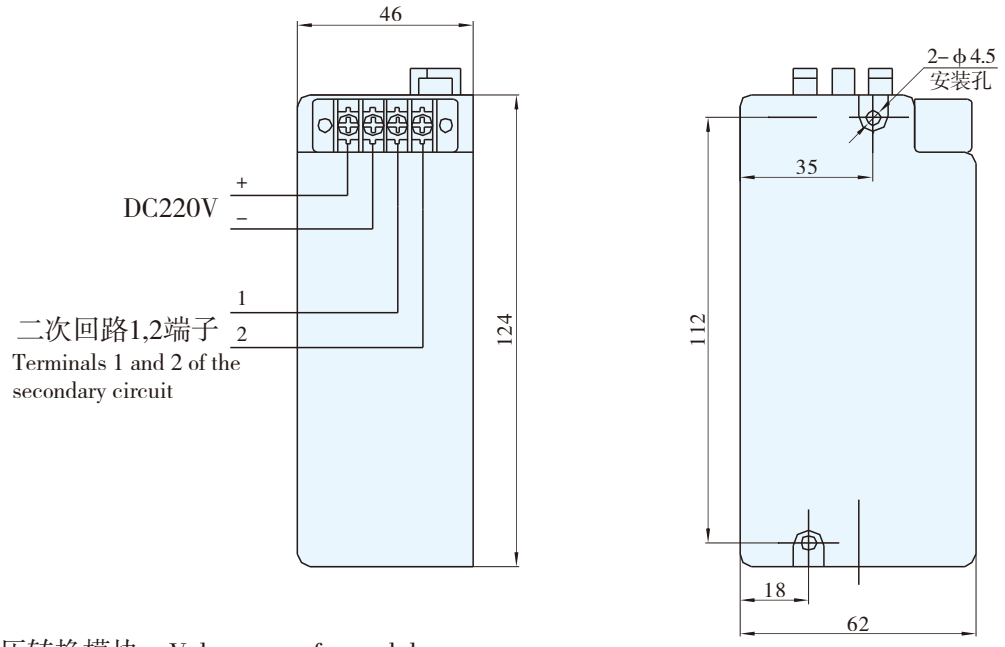
| | 柜壁 Switchboard wall | 带电部分 Live part |
|---|---|---|
| d1(注note)(mm) | 0 | 60 |
| d2(mm) | 0 | 60 |

注：安全间隙要考虑两次回路的走线。
Note:secondary circuit wiring must be considered for safety clearance.

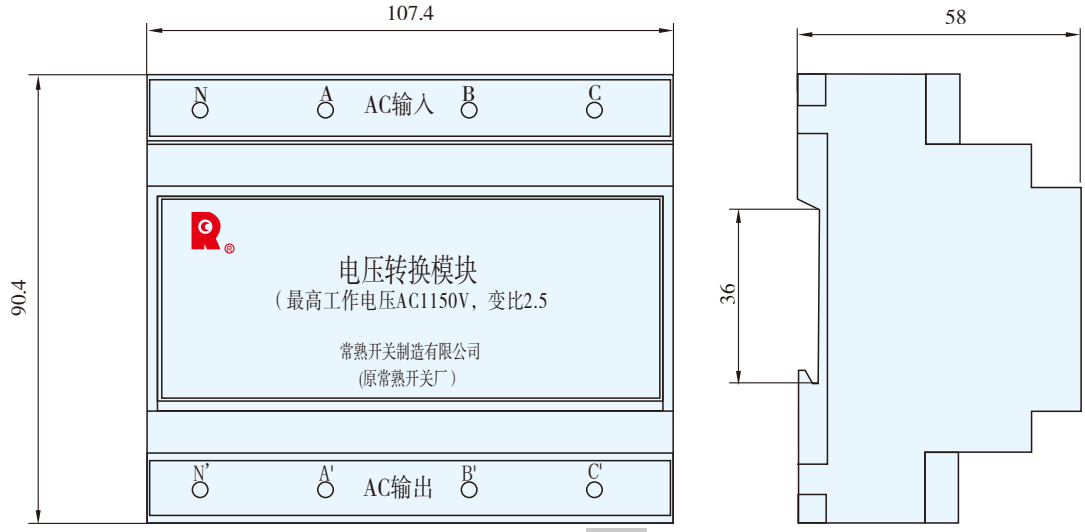
- DC24V专用电源模块 Power supply module



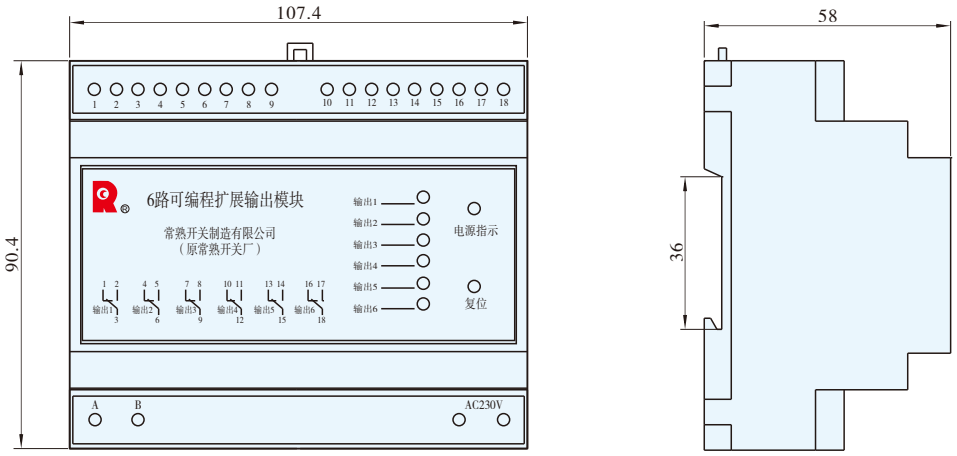

- 直流电源模块： DC power module



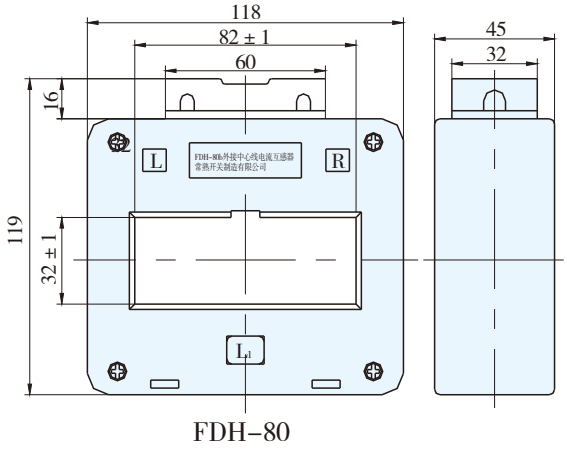

- 电压转换模块：Voltage transfer module



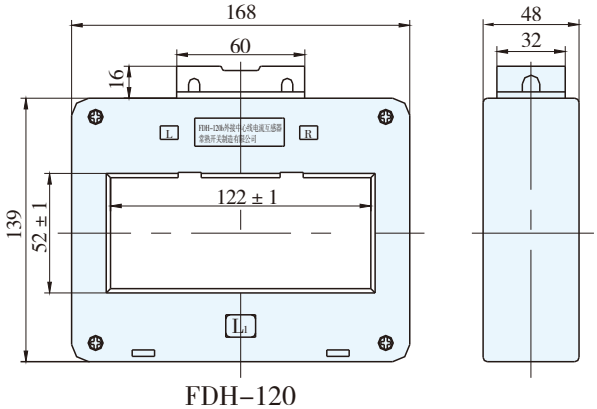
- 可编程扩展输出模块 Programmable output expansion module



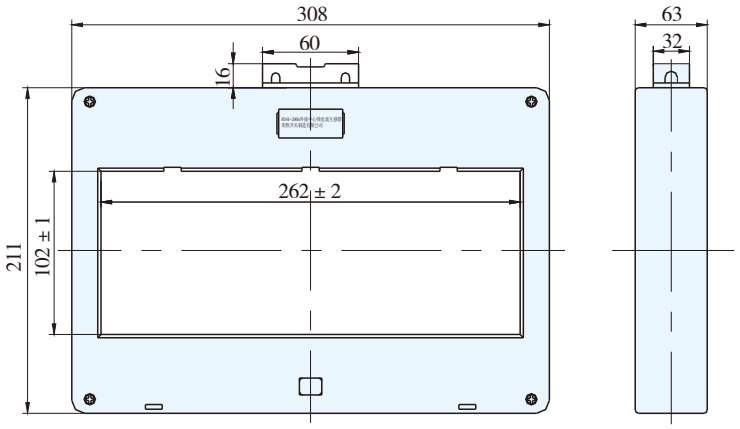

- 外接中性线互感器 Neutral transformer external connected




FDH–80



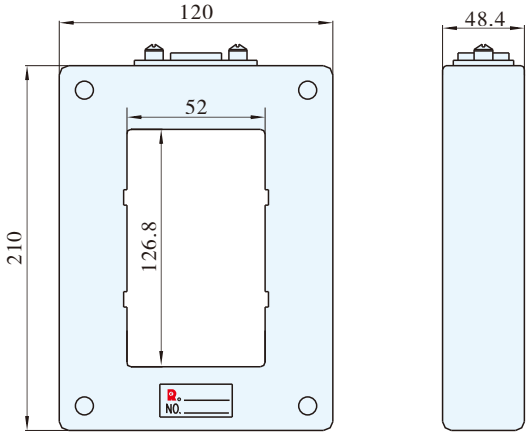

FDH–120



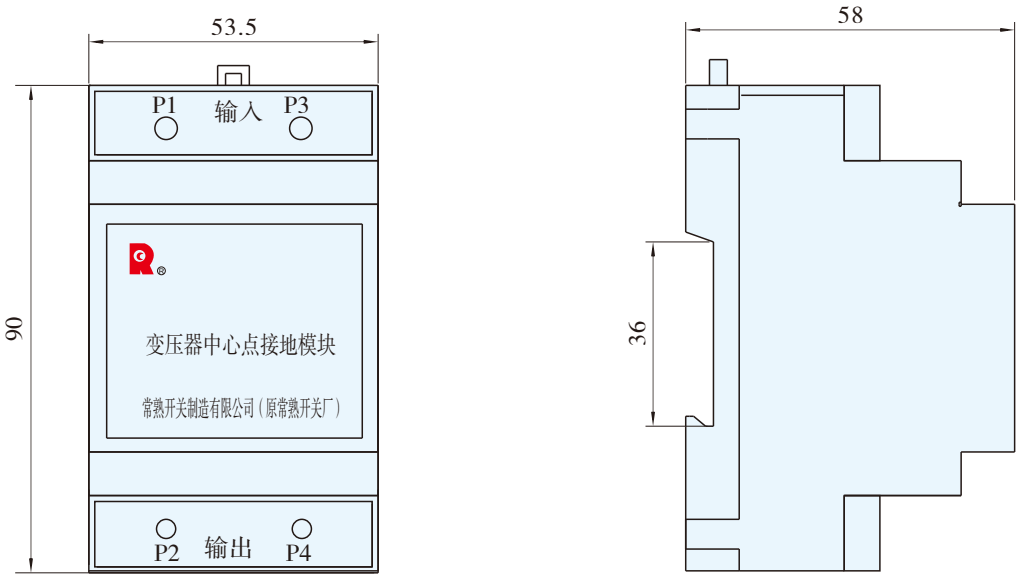

FDH–260

CW3V–3200三极断路器用户可根据N极母线大小选择中性极互感器FDH–120或FDH–260。

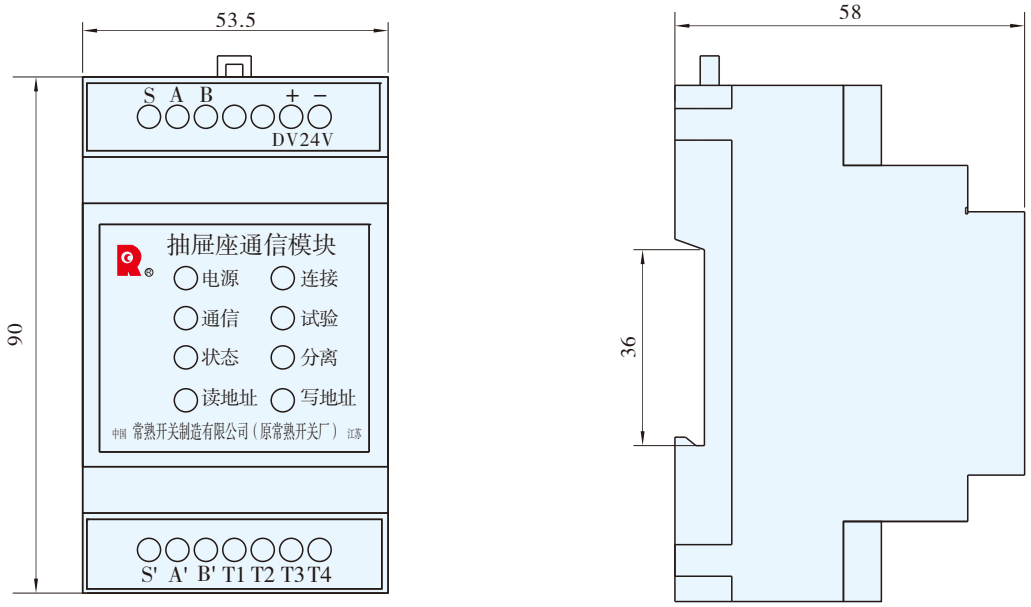
- 变压器中心点接地电流互感器 Earth transformer with transformer's center



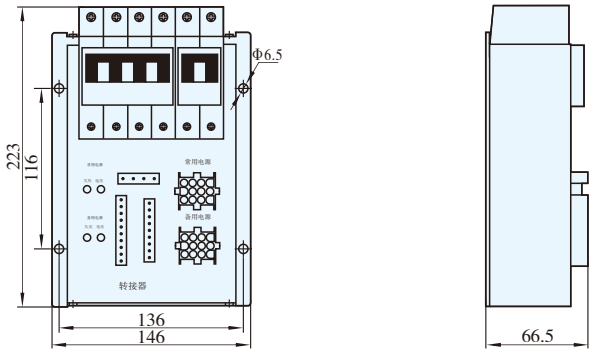
- 变压器中心点接地模块 Earth module of transformer's center



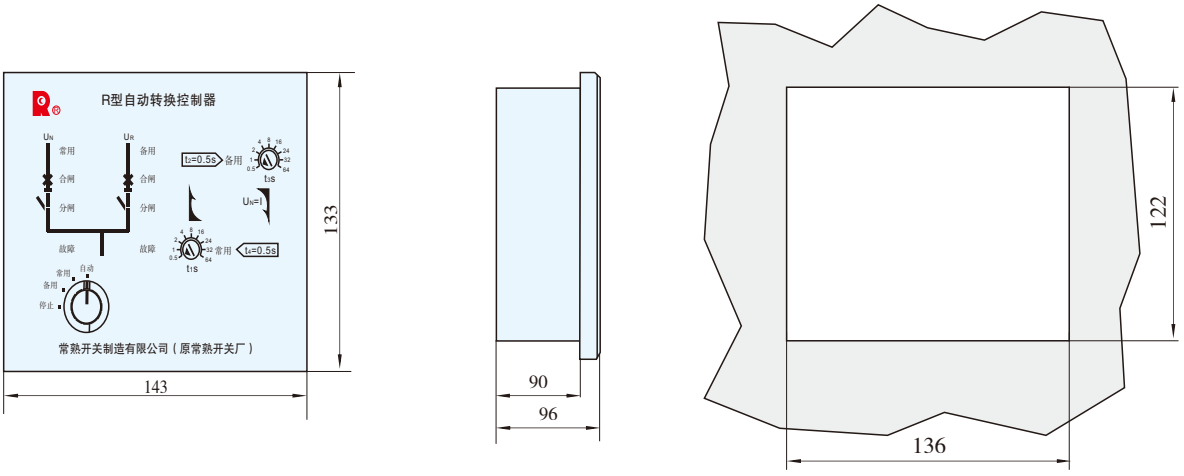

- 抽屉座通信模块 Draw-out socket communication module



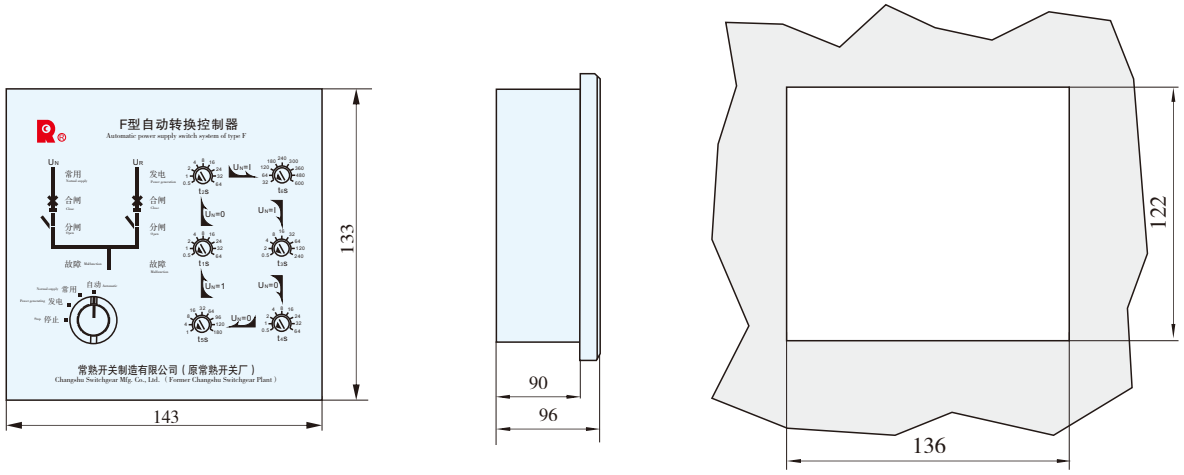
- 两电源转换 Two supply transfer
- 转接器 The switching unit



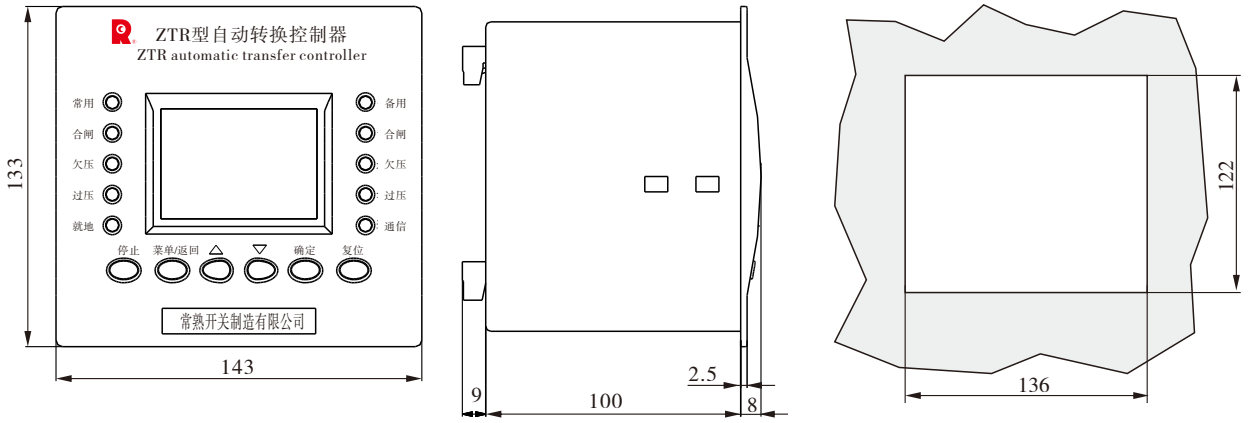

- R、S型自动转换控制器 Automatic power supply switch system of type R and S




- F型自动转换控制器 Automatic power supply switch system of type F

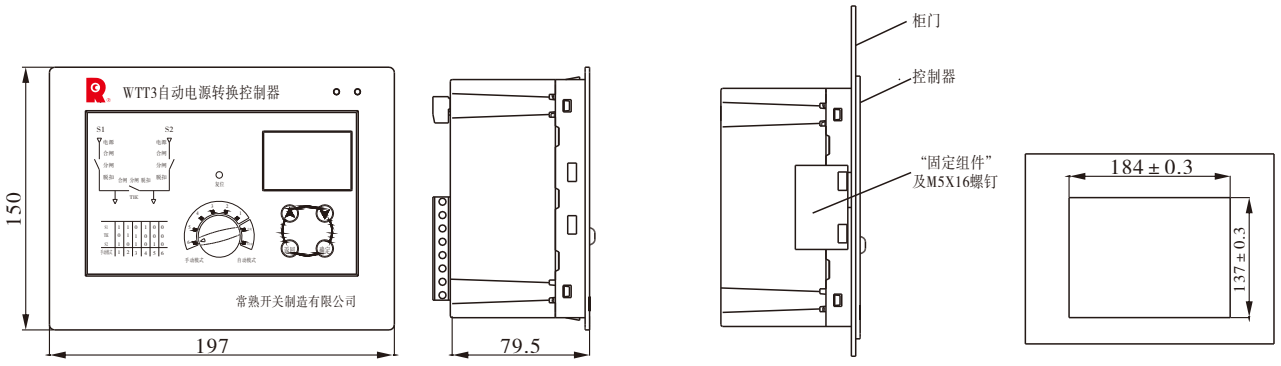


## ZR、ZS、ZF、ZTR、ZTS、ZTF自动转换控制器
Type ZR,ZS,ZF,ZTR,ZTS,ZTF automatic transfer controller



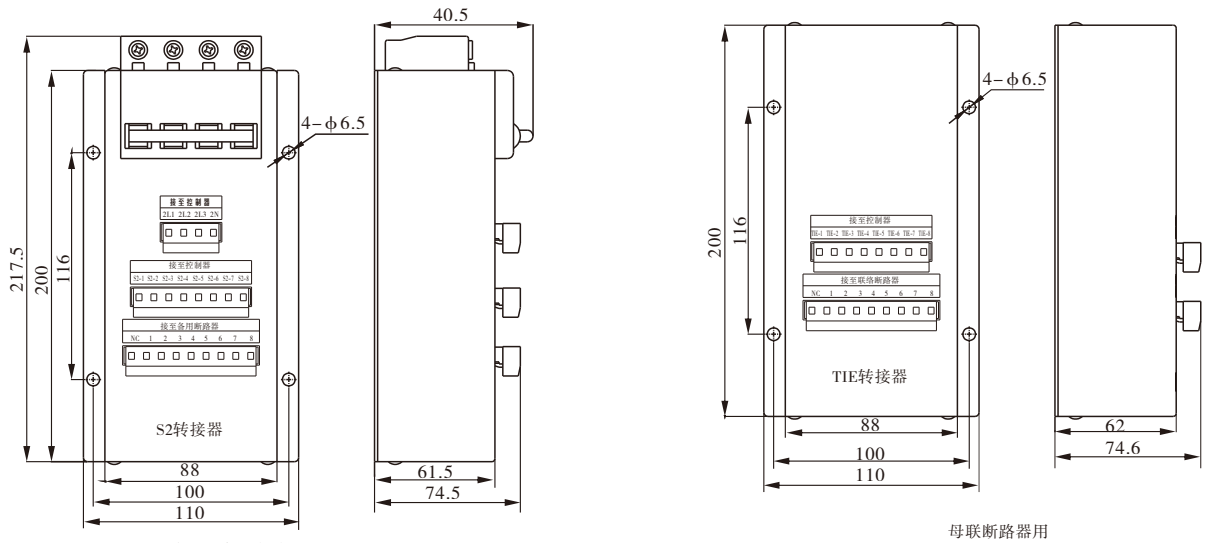

## 两进线一母联和三电源转换 Two incoming one bus conple supply and three supplys transfer

## WTT3/WTB3/WTT5自动转换控制器 Automatic transfer controller




安装开孔尺寸
mounting and cut off dimension

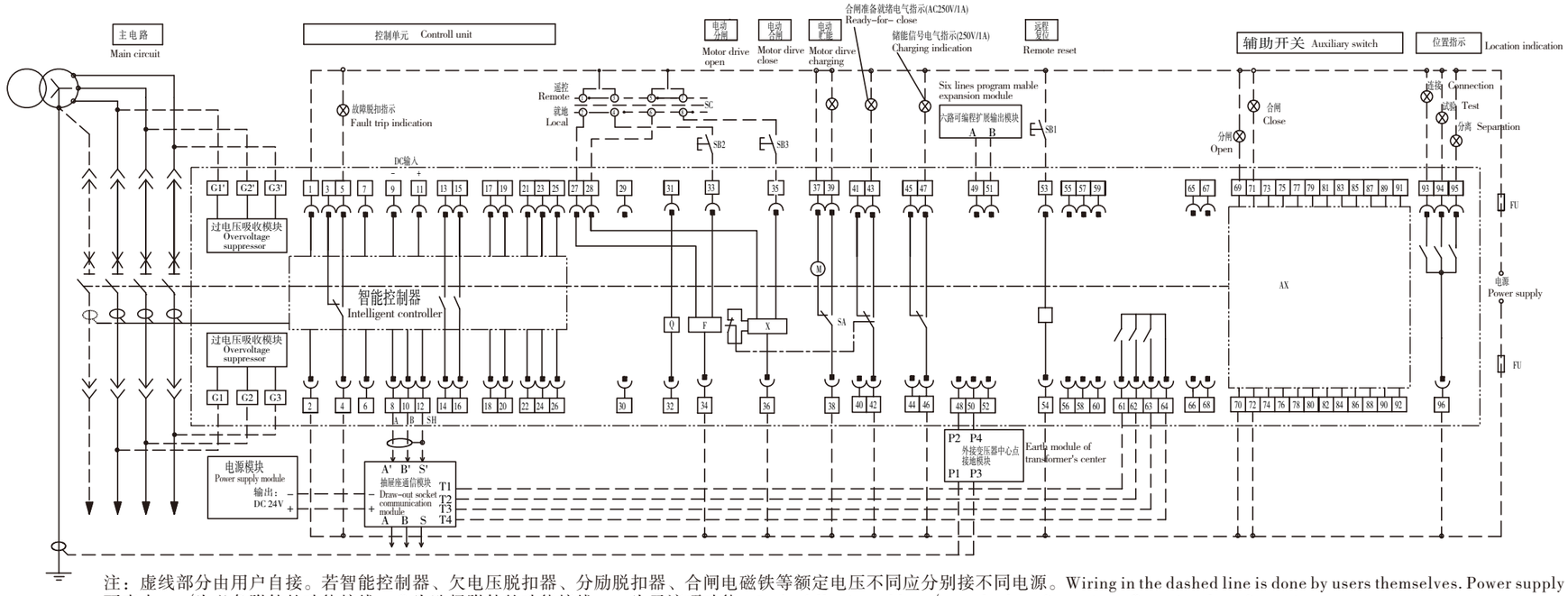
## 转接器 Adapter （WTT3/WTB3/WTT5自动转换控制器 automatic transfer controller）




常用、备用断路器用
For normal ,alternative breaker

母联断路器用
For conple breaker

# CW3V-2000/3200二次回路接线图
# 智能控制器为EN35/36、EA35/36、EP35/36、EQ35/36、EG35/36
# Wiring diagram of the secondary circuit of CW3V-2000/3200

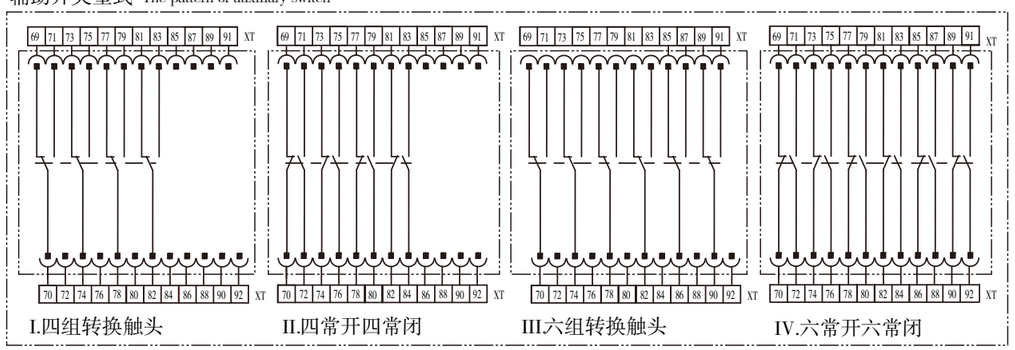



| | | |
|---|---|---|
| SB1 | 远程复位按钮 | Remote reset button |
| SB2 | 分励按钮 | Shunt button |
| SB3 | 合闸按钮 | Closing button |
| SC | 转换开关 | chang-over switch |
| Q | 欠电压脱扣器或欠电压延时脱扣器 | Under-voltage release |
| F | 分励脱扣器 | Shunt release |
| X | 合闸电磁铁 | Closing electromagnet |
| M | 贮能电机 | Charging motor |
| SA | 电动机行程开关 | Limit switch |
| XT | 断路器两次回路接线端子 | Terminals |
| FU | 熔断器 | Fuse |
| AX | 断路器辅助开关 | Auxiliary switch |

注：虚线部分由用户自接。若智能控制器、欠电压脱扣器、分励脱扣器、合闸电磁铁等额定电压不同应分别接不同电源。Wiring in the dashed line is done by users themselves. Power supply is different for different rated voltage of controller, Q, F,X etc

下表中，√为必备附件的功能接线；○为选择附件的功能接线；—为无该项功能。In the following table, √: standard configuration , ○: optional configuration, —: none.

辅助开关型式 The pattern of auxiliary switch




I.四组转换触头 Four pairs of changeover contacts

II.四常开四常闭 Four pieces of normally-open contacts and four pieces of normally-closed contacts

III.六组转换触头 Six pairs of changover contacts

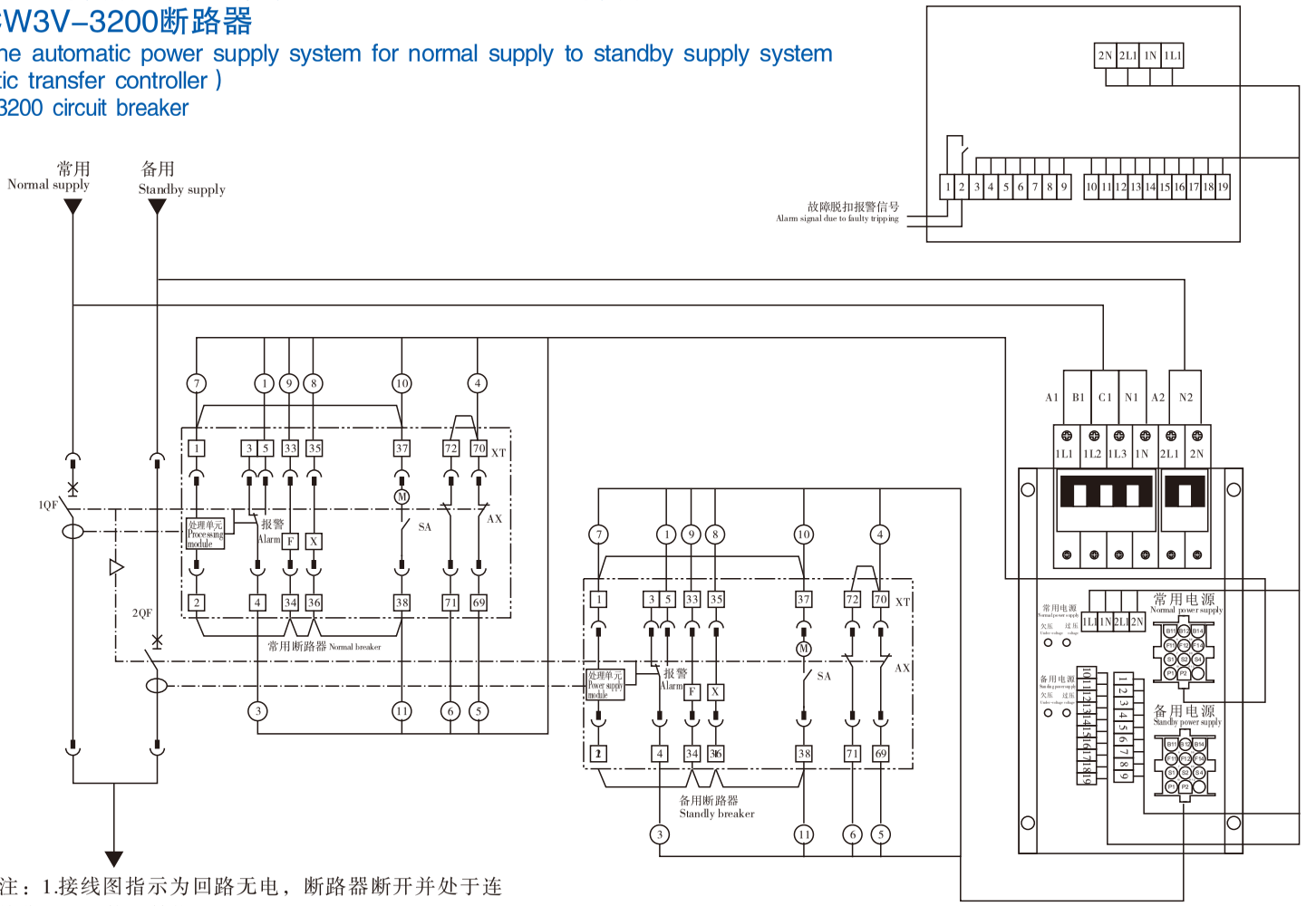
IV.六常开六常闭 Six pieces of normally-open contacts and six pieces of normally-closed contacts

特别注意：辅助电源电压为DC110V、220V时，需通过直流电源模块转换成DC24V接入1、2端子。
Specical note: when the voltage of auxiliary power supply is DC110V or DC220V, DC power supply module should be transformed to DC24V in connection with terminals of 1 and 2.

| 端子号 Terminal | 功能Function | | 适用控制器类型 Controller type | | | | |
|---|---|---|---|---|---|---|---|
| | | | EN35/36 | EA35/36 | EP35/36 | EQ35/36 | EG35/36 |
| 1, 2 | 辅助电源 | Auxiliary power supply | √ | √ | √ | √ | √ |
| 3, 4, 5 | 故障指示触点(AC250V 1A) | Fault Instruction (AC250V 1A) | √ | √ | √ | √ | √ |
| 6, 7 | 当三极断路器选择外接中性线电流互感器时，接至外接中性线电流互感器。其中6接互感器端子R，7接互感器端子L。 | Three-pole circuit breaker with current transformer with neutral line N, 6 to R, 7 to L. | ○ | ○ | ○ | ○ | ○ |
| 8, 10, 12 | A、B为RS485通信接口，SH接屏蔽层，其中8接A，10接B，12接SH。若有抽屉座通信模块，则接至抽屉座通信模块输入，8接A'，10接B'，12接S' | A/B is RS485 interface, 8 to A, 10 to B, 12 to SH<br>If with components of draw-out socket communication module , 8 to A' , 10 to B' , 12 to S' | ○ | ○ | ○ | ○ | ○ |
| 9,11 | 通信型断路器需要时接入DC24V电源 9接 "-"，11接 "+" | connecting DC24V power supply if necessary for communicative circuit breaker | ○ | ○ | ○ | ○ | ○ |
| 13, 14 | 可编程输出1 | Programmable out 1 | ○ | ○ | ○ | ○ | ○ |
| 15, 16 | 可编程输出2 | Programmable out 2 | ○ | ○ | ○ | ○ | ○ |
| 17,18,19,20 | 电压显示用A、B、C、N，三相电压输入端，当主回路电压大于AC400V需通过电压转换模块接入 | Voltage display by voltage input of the phases: A, B, C and N, when main voltage is large than AC400V,Voltage changover Module must be selected. | ○ | — | √ | √ | √ |
| 21,22 | ZSI信号输出，21接 "+"，22接 "COM" | ZSI signal output, 21 connecting "+" , 22 connecting "COM" | ○ | ○ | ○ | ○ | ○ |
| 23,24 | ZSI信号输入，23接 "+"，24接 "COM" | ZSI signal input, 23 connecting "+" , 24 connecting "COM" | ○ | ○ | ○ | ○ | ○ |
| 27 | 遥控分闸时接与33端子同相位电源 | When remote open, connecting terminal 33 | ○ | ○ | ○ | ○ | ○ |
| 28 | 遥控合闸时接与35端子同相位电源 | When remote close, connecting terminal 35 | ○ | ○ | ○ | ○ | ○ |
| 31, 32 | 欠电压脱扣器（应接在主回路中） | Connect with under-voltage release | ○ | ○ | ○ | ○ | ○ |
| 33, 34 | 分励脱扣器 | Connect with shunt release | √ | √ | √ | √ | √ |
| 35, 36 | 合闸电磁铁 | Connect with closing electromagnet | √ | √ | √ | √ | √ |
| 37,38,39 | 电动(电机贮能。37,38可直接接电源（自动预贮能），也可串接常开按钮后接电源（手动预贮能） | Connect with Motor driven operating mechanism. Power supply directly (auto energy prestore) or power supply with a NO(normal open) button simultaneously ( manual energy prestore) with 37,38. | √ | √ | √ | √ | √ |
| 41,42,43 | 合闸准备就绪电气指示 | Ready-for-close indication | ○ | ○ | ○ | ○ | ○ |
| 45,46,47 | 储能信号电气指示 | charging indication | √ | √ | √ | √ | √ |
| 48,50,52 | 接地电流模块，48接P2，50接P4 | earth current module, 48 connecting P2, 50 connecting P4 | ○ | ○ | ○ | ○ | ○ |
| 49,51 | 可编程扩展输出，49接A，51接B | Programmable expansion output, 49 connecting A, 51 connecting B | ○ | ○ | ○ | ○ | ○ |
| 53,54 | 远程复位 | Remote reset | ○ | ○ | ○ | ○ | ○ |
| 69~92 | 辅助开关连接端子 | Connecting terminals of auxiliary switch | √ | √ | √ | √ | √ |
| 93,96 | 抽屉座 "连接" 位置指示（AC250V 1A） | "Connected" position indication （AC250V 1A） | ○ | ○ | ○ | ○ | ○ |
| 94,96 | 抽屉座 "试验" 位置指示（AC250V 1A） | "Test" position indication（AC250V 1A） | ○ | ○ | ○ | ○ | ○ |
| 95,96 | 抽屉座 "分离" 位置指示（AC250V 1A） | "Separated" position indication（AC250V 1A） | ○ | ○ | ○ | ○ | ○ |
| 61,62,63,64 | 位置信号输出至抽屉座通信模块 | Location signal output to draw-out socket communication Module | ○ | ○ | ○ | ○ | ○ |
| T1,T2,T3,T4 | 抽屉座通信模块位置信号输入，61至T1，62至T2，63至T3，64至T4 | Input of draw-out socket communication module location Signal, 61 connecting T1,62 connecting T2,63 connecting T3,64 connecting T4 | ○ | ○ | ○ | ○ | ○ |
| A, B, S | 抽屉座通信模块通信输出 | Communication output of draw-out socket communication module | ○ | ○ | ○ | ○ | ○ |
| A', B', S' | 抽屉座通信模块通信输入，连接本体通信输出，A' 接8，B' 接10，S' 接12 | Communication input of draw-out socket communication module , connect with communication output of the main body, A' connect with 8, B' with10, S' with 12 | ○ | ○ | ○ | ○ | ○ |
| P1,P3 | 接外接变压器中心点接地互感器 | Connecting earth transformer of transformer center | ○ | ○ | ○ | ○ | ○ |
| G1，G2，G3 | 接断路器主回路出线端 | To output of breaker's main circuit | ○ | ○ | ○ | ○ | ○ |
| G1', G2', G3' | 接断路器主回路进线端 | To input of breaker's main circuit | ○ | ○ | ○ | ○ | ○ |

# 常用–备用自动电源转换系统电气线路图（R型、S型自动转换控制器）CW3V–2000/CW3V–3200断路器

Wiring diagram of the automatic power supply system for normal supply to standby supply system （R,S type automatic transfer controller） CW3V–2000/CW3V–3200 circuit breaker




注：1.接线图指示为回路无电，断路器断开并处于连接位置，机构已储能。

2.当采用自动电源转换系统供电时，断路器智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压为AC230V。

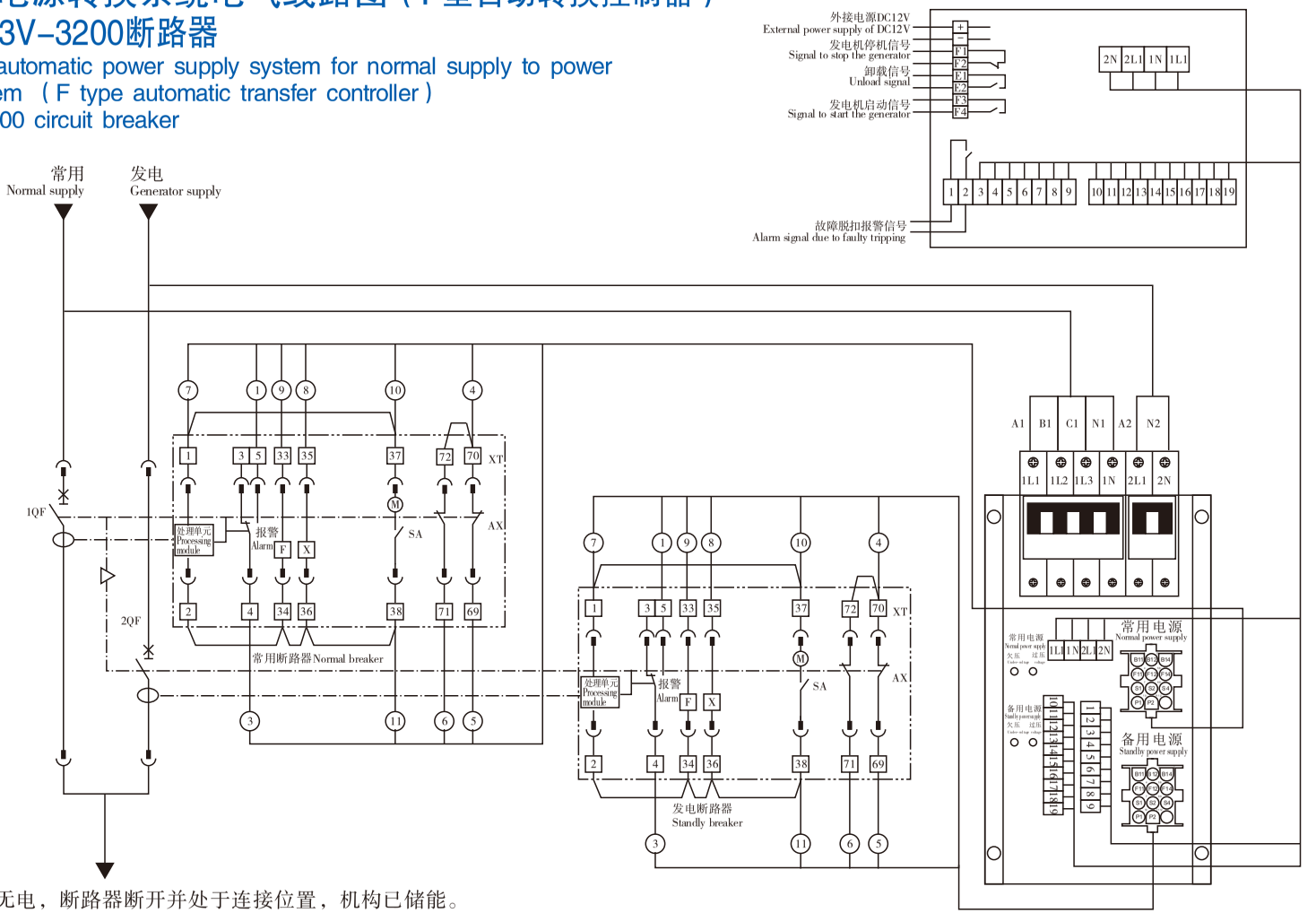
Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.
2. When Automatic power supply switch system is at work, the voltage of intelligent controller, the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

AX–断路器辅助开关
F–断路器分励脱扣器
X–断路器合闸电磁铁
M–断路器贮能电机
SA–断路器贮能电动机行程开关
XT–断路器二次回路接线端子

AX – Auxiliary switch
F – Shunt release
X – The electro–magnet to close the breaker
M – Charging motor
SA – Travel–limit switch for the charging motor of the breaker
XT – Terminals for the secondary circuit of the breaker

# 常用-发电自动电源转换系统电气线路图（F型自动转换控制器）CW3V-2000/CW3V-3200断路器

## Wiring diagram of the automatic power supply system for normal supply to power generating supply system （F type automatic transfer controller）CW3V-2000/CW3V-3200 circuit breaker




注：1.接线图指示为回路无电，断路器断开并处于连接位置，机构已储能。

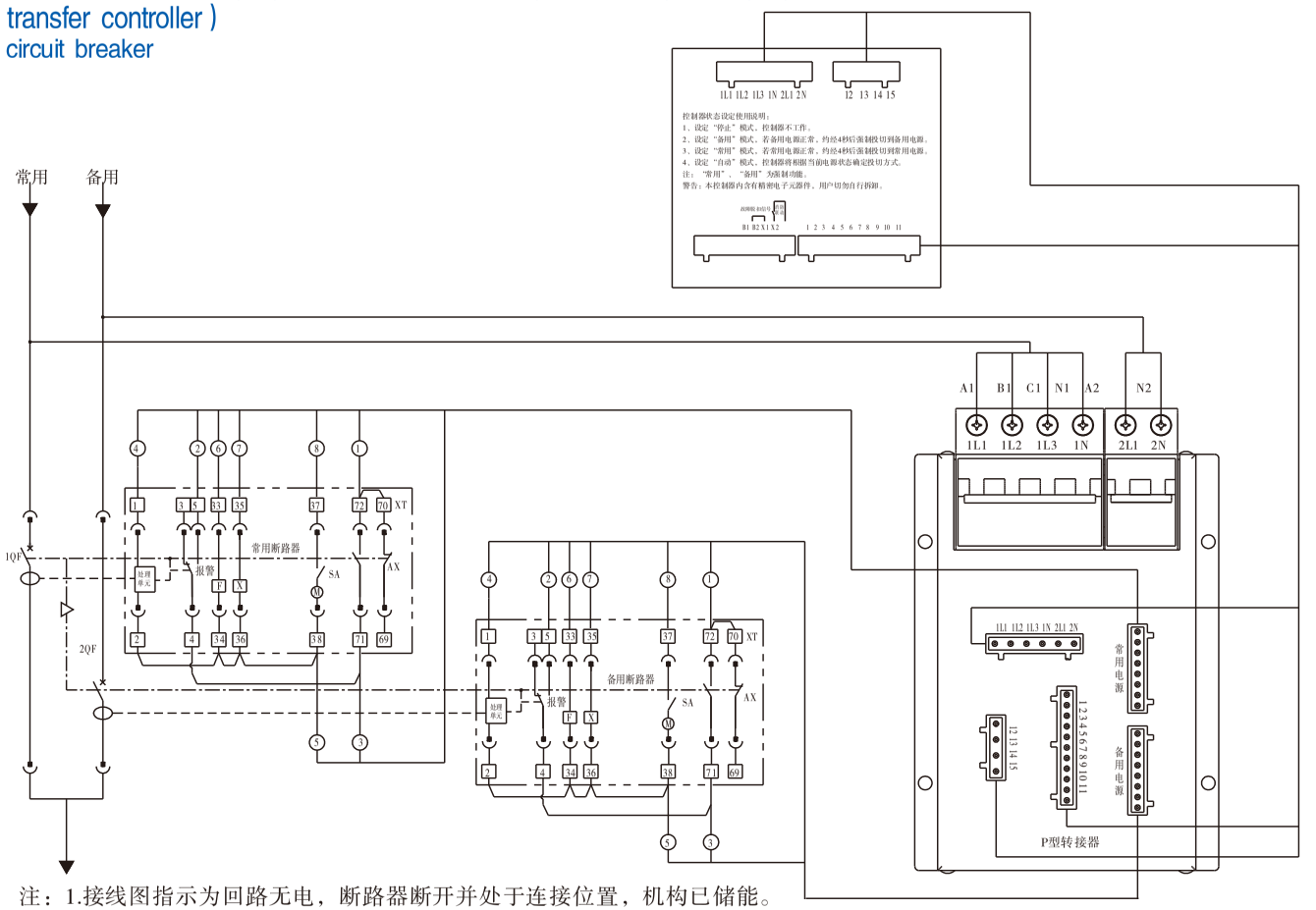
2.当采用自动电源转换系统供电时，断路器智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压为AC230V。

Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.
2. When Automatic power supply switch system is at work, the voltage of intelligent controller, the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

| | |
|---|---|
| AX-断路器辅助开关 | AX – Auxiliary switch |
| F-断路器分励脱扣器 | F – Shunt release |
| X-断路器合闸电磁铁 | X – The electro-magnet to close the breaker |
| M-断路器贮能电机 | M – Charging motor |
| SA-断路器贮能电动机行程开关 | SA – Travel-limit switch for the charging motor of the breaker |
| XT-断路器二次回路接线端子 | XT – Terminals for the secondary circuit of the breaker |

说明：当常用电源正常时，发电机启动信号（F3、F4）、发电机停机信号（F1、F2）、卸载信号（E1、E2）均处于断开位置。
当常用电源失电后，发电机停机信号（F1、F2）立即闭合，发电机启动信号（F3、F4）经t5延时后闭合。
当发电机电源发出后，发电机启动信号（F3、F4）立即断开，卸载信号（E1、E2）经t1延时后闭合。
当常用电源恢复后，卸载信号（E1、E2）立即断开，发电机停机信号（F1、F2）经t6延时后断开。

# 常用-备用自动电源转换系统电气线路图（ZR型、ZS型自动转换控制器）
# CW3V-2000/CW3V-3200断路器
## Wiring diagram of the automatic power supply system for normal supply to standby supply system
## （ZR,ZS type automatic transfer controller）
## CW3V-2000/CW3V-3200 circuit breaker




注：1.接线图指示为回路无电，断路器断开并处于连接位置，机构已储能。

2.当采用自动电源转换系统供电时，断路器智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压为AC230V。

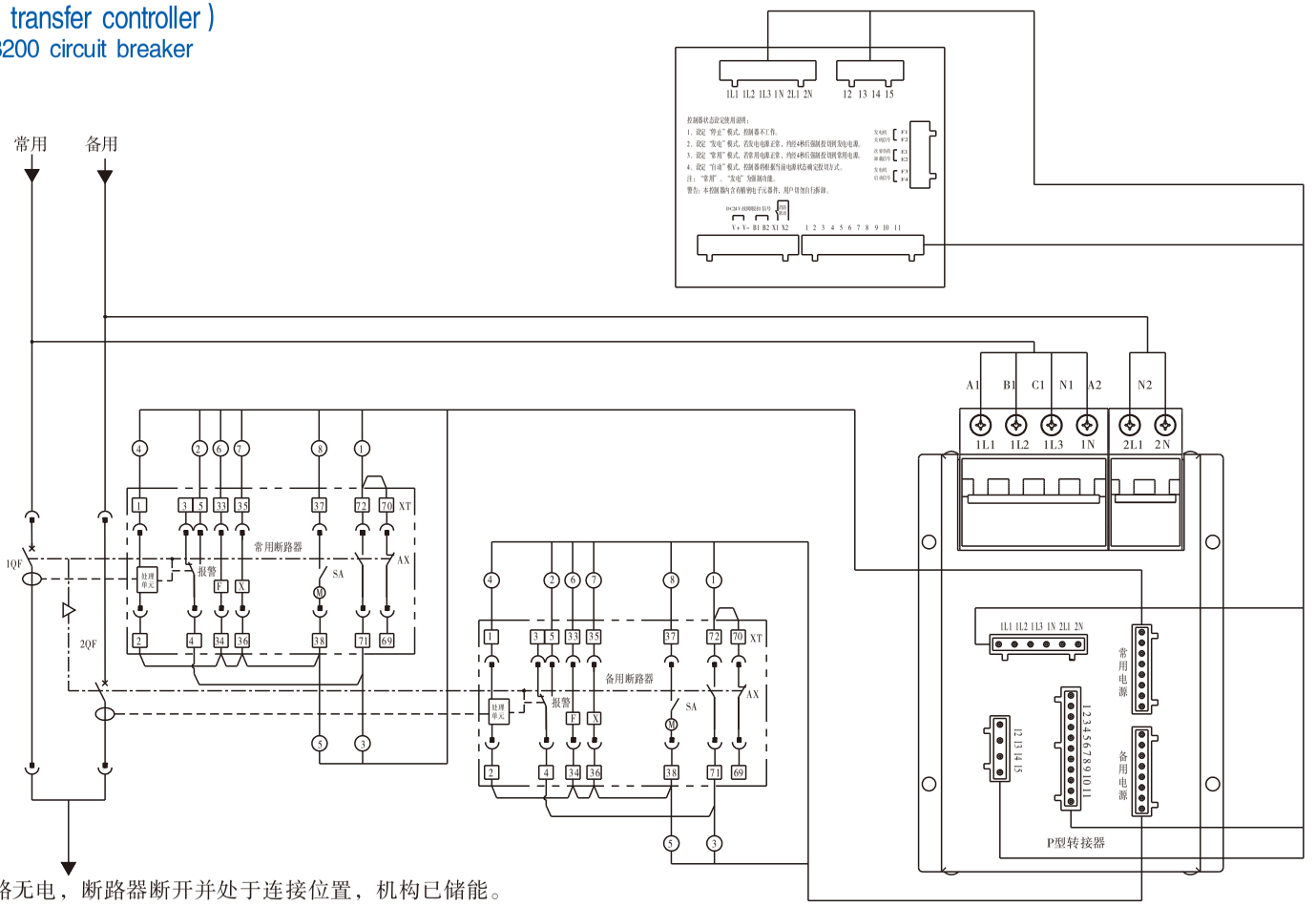
Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.

2. When Automatic power supply switch system is at work, the voltage of intelligent controller, the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

AX-断路器辅助开关
F-断路器分励脱扣器
X-断路器合闸电磁铁
M-断路器贮能电机
SA-断路器贮能电动机行程开关
XT-断路器二次回路接线端子

AX-Auxiliary switch
F-Shunt release
X-The electro-magnet to close the breaker
M-Charging motor
SA-Overtravel-limit switch for the charging motor of the breaker
XT-Terminals for the secondary circuit of the breaker

# 常用-备用自动电源转换系统电气线路图（ZF型自动转换控制器）
# CW3V-2000/CW3V-3200断路器
## Wiring diagram of the automatic power supply system for normal supply to standby supply system （ZF type automatic transfer controller）
## CW3V-2000/CW3V-3200 circuit breaker




注：1.接线图指示为回路无电，断路器断开并处于连接位置，机构已储能。

2.当采用自动电源转换系统供电时，断路器智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压为AC230V。

Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.

2. When Automatic power supply switch system is at work, the voltage of intelligent controller, the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

| | |
|---|---|
| AX-断路器辅助开关 | AX-Auxiliary switch |
| F-断路器分励脱扣器 | F-Shunt release |
| X-断路器合闸电磁铁 | X-The electro-magnet to close the breaker |
| M-断路器贮能电机 | M-Charging motor |
| SA-断路器贮能电动机行程开关 | SA-Overtravel-limit switch for the charging motor of the breaker |
| XT-断路器二次回路接线端子 | XT-Terminals for the secondary circuit of the breaker |

说明：当常用电源正常时，发电机启动信号（F3、F4）、发电机停机信号（F1、F2）、卸载信号（E1、E2）均处于断开位置。

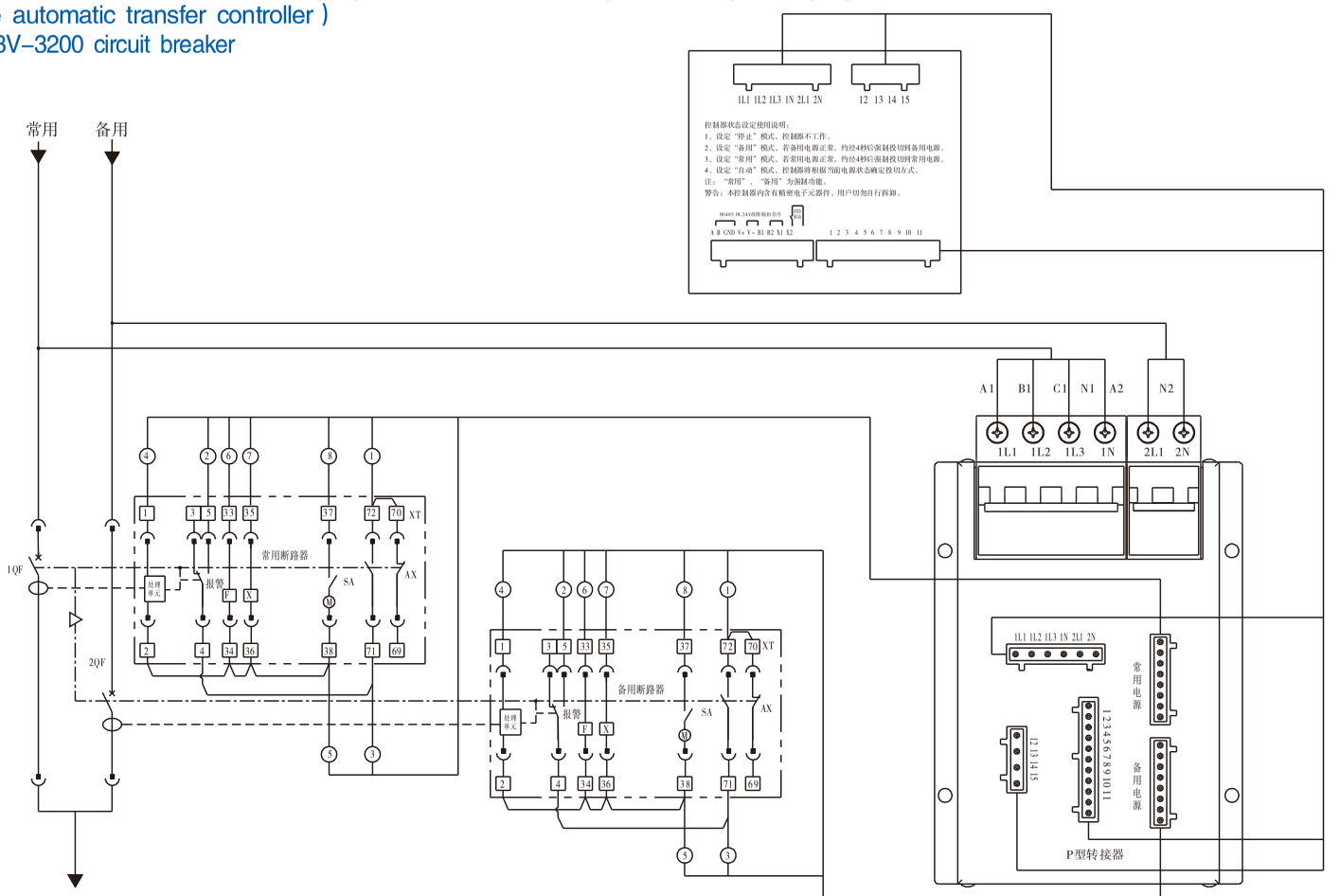
当常用电源失电后，发电机停机信号（F1、F2）立即闭合，发电机启动信号（F3、F4）经t5延时后闭合。

当发电机电源发出后，发电机启动信号（F3、F4）立即断开，卸载信号（E1、E2）经t1延时后闭合。

当常用电源恢复后，卸载信号（E1、E2）立即断开，发电机停机信号（F1、F2）经t6延时后断开。

# 常用-备用自动电源转换系统电气线路图（ZTR型、ZTS型自动转换控制器）
# CW3V-2000/CW3V-3200断路器

## Wiring diagram of the automatic power supply system for normal supply to standby supply system （ZTR,ZTS type automatic transfer controller）
## CW3V-2000/CW3V-3200 circuit breaker




注：1.接线图指示为回路无电，断路器断开并处于连接位置，机构已储能。

2.当采用自动电源转换系统供电时，断路器智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压为AC230V。

Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.

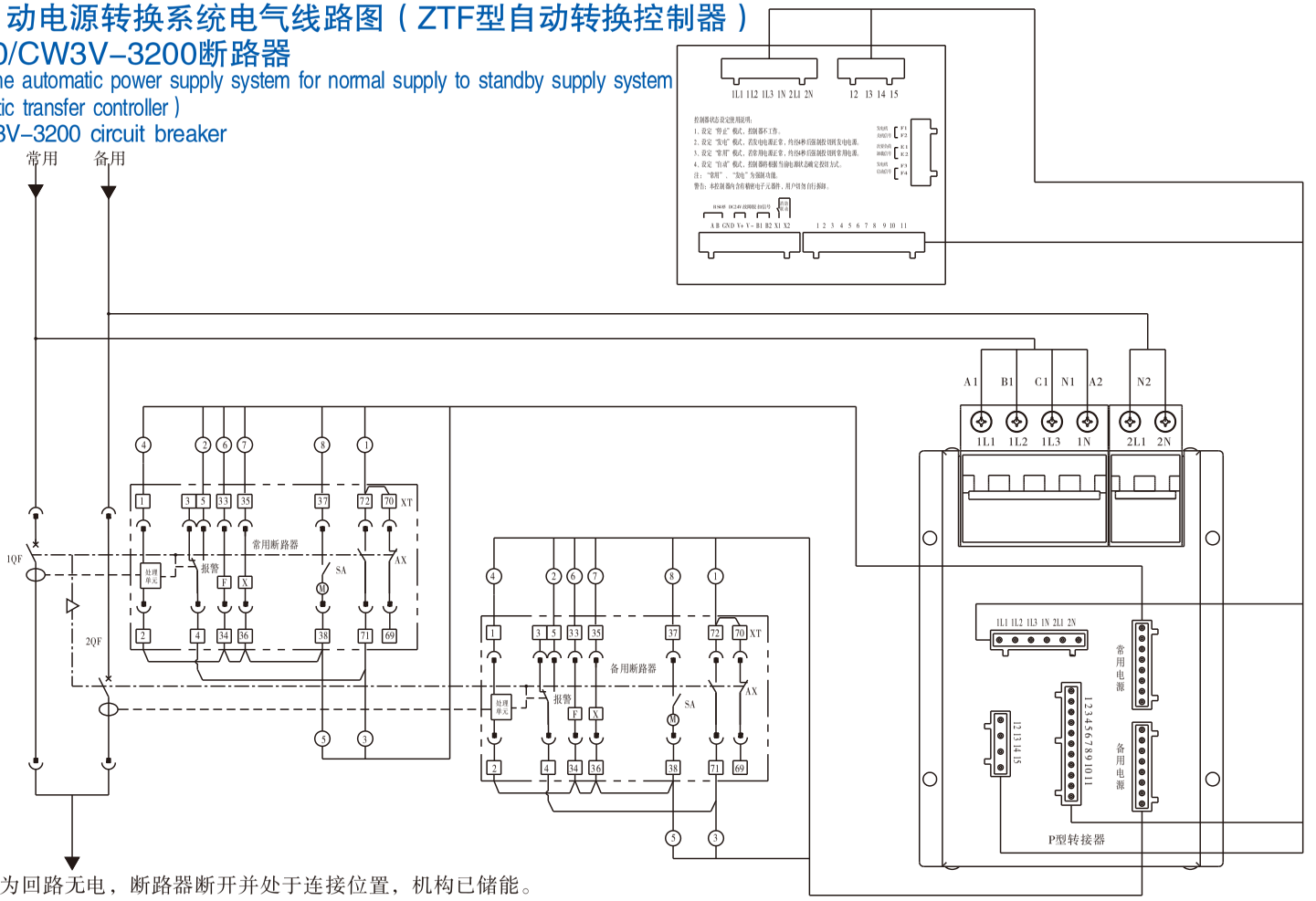
2. When Automatic power supply switch system is at work, the voltage of intelligent controller, the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

AX-断路器辅助开关
F-断路器分励脱扣器
X-断路器合闸电磁铁
M-断路器贮能电机
SA-断路器贮能电动机行程开关
XT-断路器二次回路接线端子

AX-Auxiliary switch
F-Shunt release
X-The electro-magnet to close the breaker
M-Charging motor
SA-Overtravel-limit switch for the charging motor of the breaker
XT-Terminals for the secondary circuit of the breaker

# 常用-备用自动电源转换系统电气线路图（ZTF型自动转换控制器）
# CW3V-2000/CW3V-3200断路器

Wiring diagram of the automatic power supply system for normal supply to standby supply system (ZTF type automatic transfer controller)
CW3V-2000/CW3V-3200 circuit breaker




注：1.接线图指示为回路无电，断路器断开并处于连接位置，机构已储能。
2.当采用自动电源转换系统供电时，断路器智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压为AC230V。

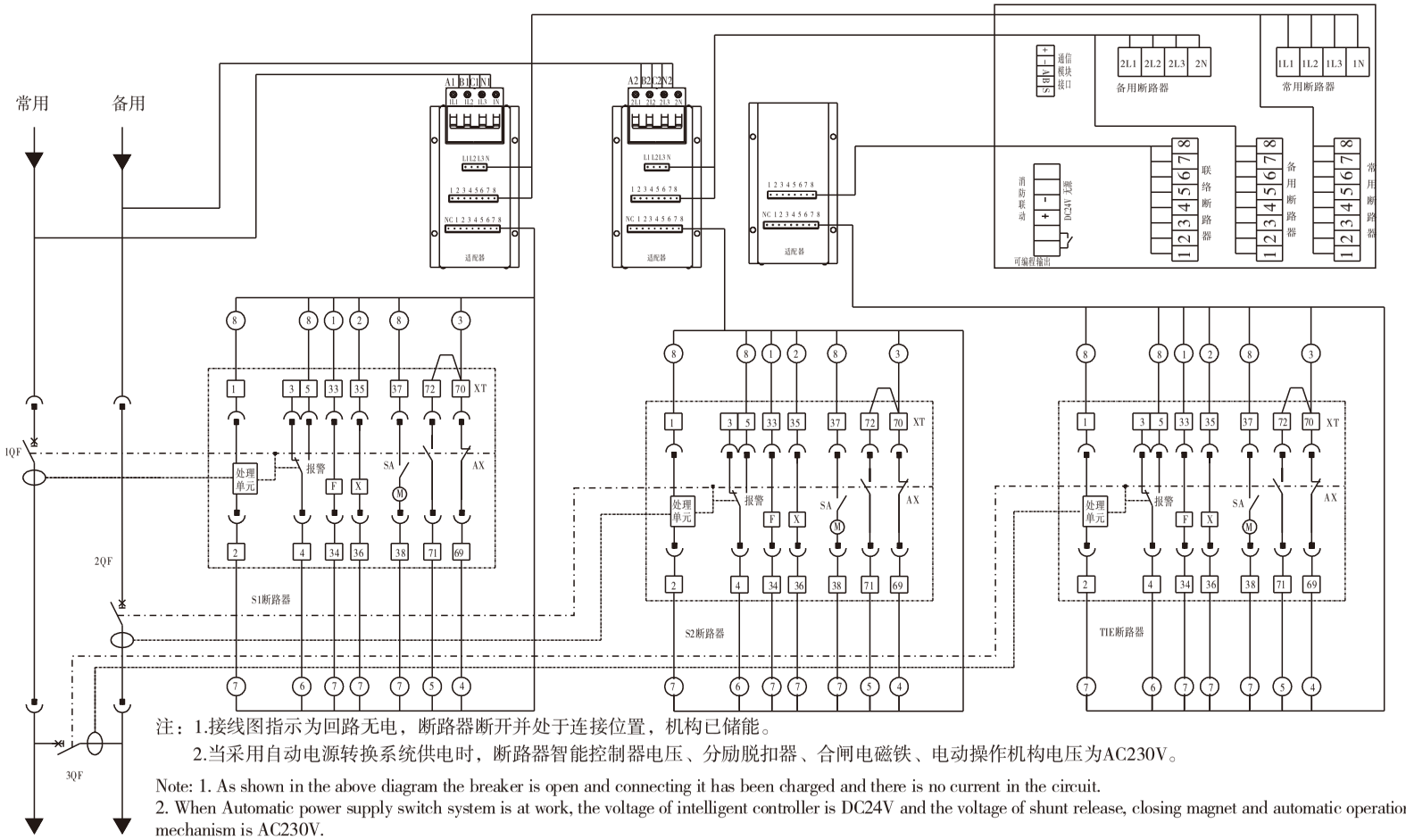
Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.
2. When Automatic power supply switch system is at work, the voltage of intelligent controller, the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

| | |
|---|---|
| AX-断路器辅助开关 | AX-Auxiliary switch |
| F-断路器分励脱扣器 | F-Shunt release |
| X-断路器合闸电磁铁 | X-The electro-magnet to close the breaker |
| M-断路器贮能电机 | M-Charging motor |
| SA-断路器贮能电动机行程开关 | SA-Overtravel-limit switch for the charging motor of the breaker |
| XT-断路器二次回路接线端子 | XT-Terminals for the secondary circuit of the breaker |

说明：当常用电源正常时，发电机启动信号（F3、F4）、发电机停机信号（F1、F2）、卸载信号（E1、E2）均处于断开位置。
当常用电源失电后，发电机停机信号（F1、F2）立即闭合，发电机启动信号（F3、F4）经t5延时后闭合。
当发电机电源发出后，发电机启动信号（F3、F4）立即断开，卸载信号（E1、E2）经t1延时后闭合。
当常用电源恢复后，卸载信号（E1、E2）立即断开，发电机停机信号（F1、F2）经t6延时后断开。

# 两进线一母联自动电源转换系统电气线路图（WTT3/WTB3 自动转换控制器）
# CW3V-2000/CW3V-3200断路器

Wiring diagram of the automatic power supply for two incoming one couple（WTT3/WTB3 automatic transfer controller）
CW3V-2000/CW3V-3200 circuit breaker



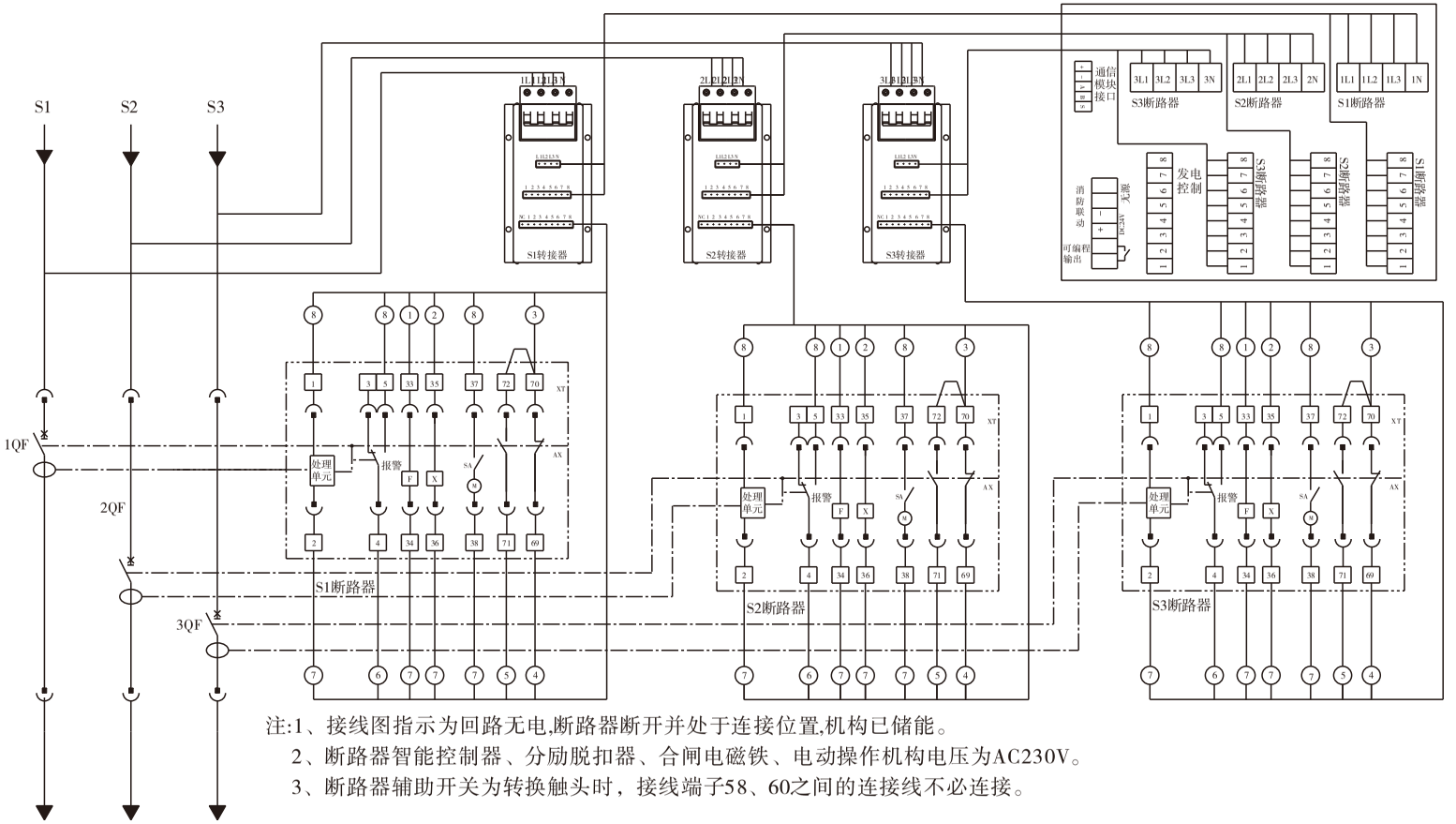

注：1.接线图指示为回路无电，断路器断开并处于连接位置，机构已储能。
2.当采用自动电源转换系统供电时，断路器智能控制器电压、分励脱扣器、合闸电磁铁、电动操作机构电压为AC230V。

Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.
2. When Automatic power supply switch system is at work, the voltage of intelligent controller is DC24V and the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.

| | |
|---|---|
| AX-断路器辅助开关 | AX-Auxiliary switch |
| F-断路器分励脱扣器 | F-Shunt release |
| X-断路器合闸电磁铁 | X-The electro-magnet to close the breaker |
| M-断路器贮能电机 | M-Charging motor |
| SA-断路器贮能电动机行程开关 | SA-Overtravel-limit switch for the charging motor of the breaker |
| XT-断路器二次回路接线端子 | XT-Terminals for the secondary circuit of the breaker |

# 三电源自动电源转换系统电气线路图（WTT5型自动转换控制器）
# CW3V-2000/CW3V-3200断路器

## Wiring diagram of the automatic power supply for three supplys ( WTT5 automatic transfer controller )
## CW3V-2000/CW3V-3200 circuit breaker




注:1、接线图指示为回路无电,断路器断开并处于连接位置,机构已储能。

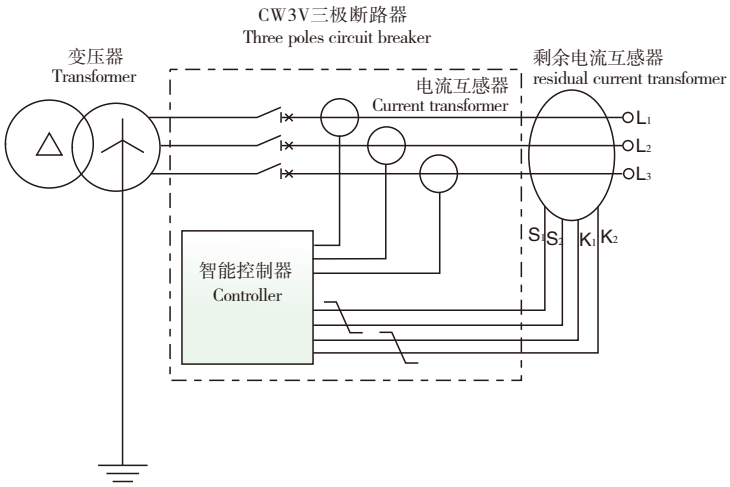
2、断路器智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压为AC230V。

3、断路器辅助开关为转换触头时，接线端子58、60之间的连接线不必连接。

Note: 1. As shown in the above diagram the breaker is open and connecting it has been charged and there is no current in the circuit.
2. When Automatic power supply switch system is at work, the voltage of intelligent controller is DC24V and the voltage of shunt release, closing magnet and automatic operation mechanism is AC230V.
3. Wire of 58, 60 terminals isn’ t connected for changover conacts

| | |
|---|---|
| AX-断路器辅助开关 | AX-Auxiliary switch |
| F-断路器分励脱扣器 | F-Shunt release |
| X-断路器合闸电磁铁 | X-The electro-magnet to close the breaker |
| M-断路器贮能电机 | M-Charging motor |
| SA-断路器贮能电动机行程开关 | SA-Overtravel-limit switch for the charging motor of the breaker |
| XT-断路器二次回路接线端子 | XT-Terminals for the secondary circuit of the breaker |

## 剩余电流保护功能说明
Instruction of residual current protection function




● CW3V-2000断路器配置了带剩余电流保护功能的智能控制器可实现附加的剩余电流保护功能。

剩余电流保护可实现以下两种形式：

①跳闸；

②跳闸并报警：发生剩余电流故障时断路器跳闸，且通过安装的“二路可编程输出模块”输出剩余电流故障报警信号。如果用户要实现输出报警触点复位，必须按智能控制器上的“Clear”键才能完成。

● 实现原理：断路器剩余电流保护功能的实现由套装于A、B、C、N相上的剩余电流互感器采样、剩余电流信号经EN37或EA37或EP37或EQ37智能控制器处理后，判别故障电流并发出相应动作信号，如图所示。采样信号经最大长度为4m的20#~14#屏蔽双绞线接至断路器二次回路接线端子，互感器输出端子S1、S2接至断路器二次端子48、50，K1、K2接至52、56。

注：对剩余电流保护，断路器二次回路接线端子1、2必须接辅助电源

● CW3V-2000 circuit breaker with intelligent controller having residual current protection function,can achieve additional residual current protection function.
Residual current protection can achieve the following two forms:
① trip;
② alarm and trip:When residual current occurs, the circuit breaker trips,and outputs residual current fault alarm signal by the installed"two-circuit programmable output module".If the customer wants to achieve output alarm contact reset,he needs to push the "Clear"button on the intelligent controller.

● Principle:residual current protection function is achieved by the sampling of residual current transformer suited on A.B.C.N phase.EN37 or EA37 or EP37 or EQ37 intelligent controller deals with residual current signal, identify fault current and send relative action signal,as figure illustrated.sampling signal goes by20#~14# shielded cable with 2 twisted pairs,whose maximum length is 4m, to circuit breaker secondary circuit wiring terminals.The residual current transformer output terminals S1,S2 and connected to the circuit residual current tramsformer breaker secondary terminals 48,50,and K1,K2 are connected to 52,56.
Note:About the residual current protection funcion, circuit breaker secondary return circuit wiring terminals 1,2 must be connected to the auxiliary supply.

## ● 带剩余电流保护功能智能控制器

Intelligent controller incorporating residual current protection function.


① EN37型、EA37型、EP37型、EQ37型智能控制器的保护功能为：过载长延时+短路短延时+短路瞬时+剩余电流保护；
② EN37型、EA37型、EP37型、EQ37型其他功能见P10；
③ EN37型、EA37型、EP37型、EQ37型智能控制器上额定剩余动作电流I△n可调，可调延时时间△t可调。

① Protection function for EN37、EA37、EP37、EQ37: overload long-time delay & short-circuit short-time delay & instantaneous short-circuit & residual current protection;
② other functions for their is seen P10;
③ Rated residual operating current and delay time are adjustable

## ● 剩余电流动作特性 Operating characteristic of residual current

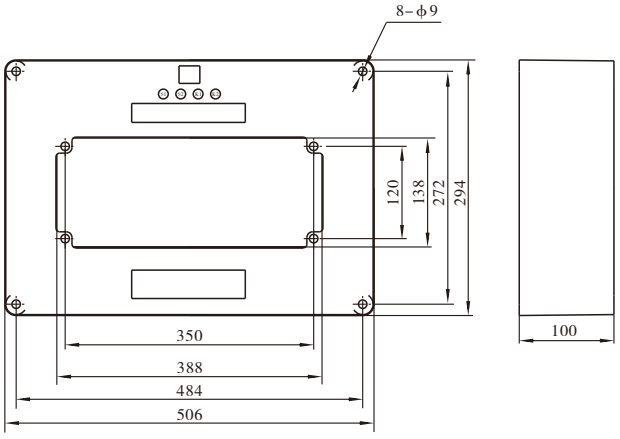
| 保护功能 Protection function | 动作电流 Operating Current | 动作时间 Operating time | | | | | | | | | 适用场合 Suit for place |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 剩余电流保护 Residual current | I△n=(0.5-1-2-3-5-7-10-20-30)A | 可调延时△t(s)* Delay time | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.80 | 1.00 | 3.00 | 5.00 | 交流AC、交流/脉动直流 A |
| | | 最大断开时间(s) Max.break time | 0.25 | 0.35 | 0.45 | 0.60 | 0.70 | 1.00 | 1.20 | 3.20 | 5.20 | |

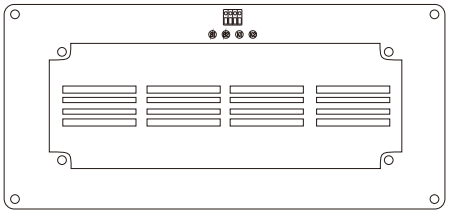
*注：按GB/T14048.2，可调延时△t为2I△n时的设定值。
*Note:△t of delay time is setting valuse of 2I△n by GB/T14048.2.

● 剩余电流互感器 Residual current transformer

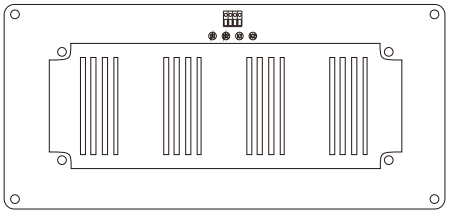
配用于CW3V-2000断路器并且智能控制器为EN37、EA37、EP37、EQ37，剩余电流互感器与三极断路器或四极断路器一起使用，套装于开关柜三相相线和中性线母线上。

Be suitable for CW3V–2000 breaker and intelligent controllers of EN37、EA37、EP37 and EQ37.it is installed at three phases and neutral bars of switchgear assenble with three poles or four poles breaker.



4根60 × 10(mm × mm)母排安装示意
Mounting type for two bars

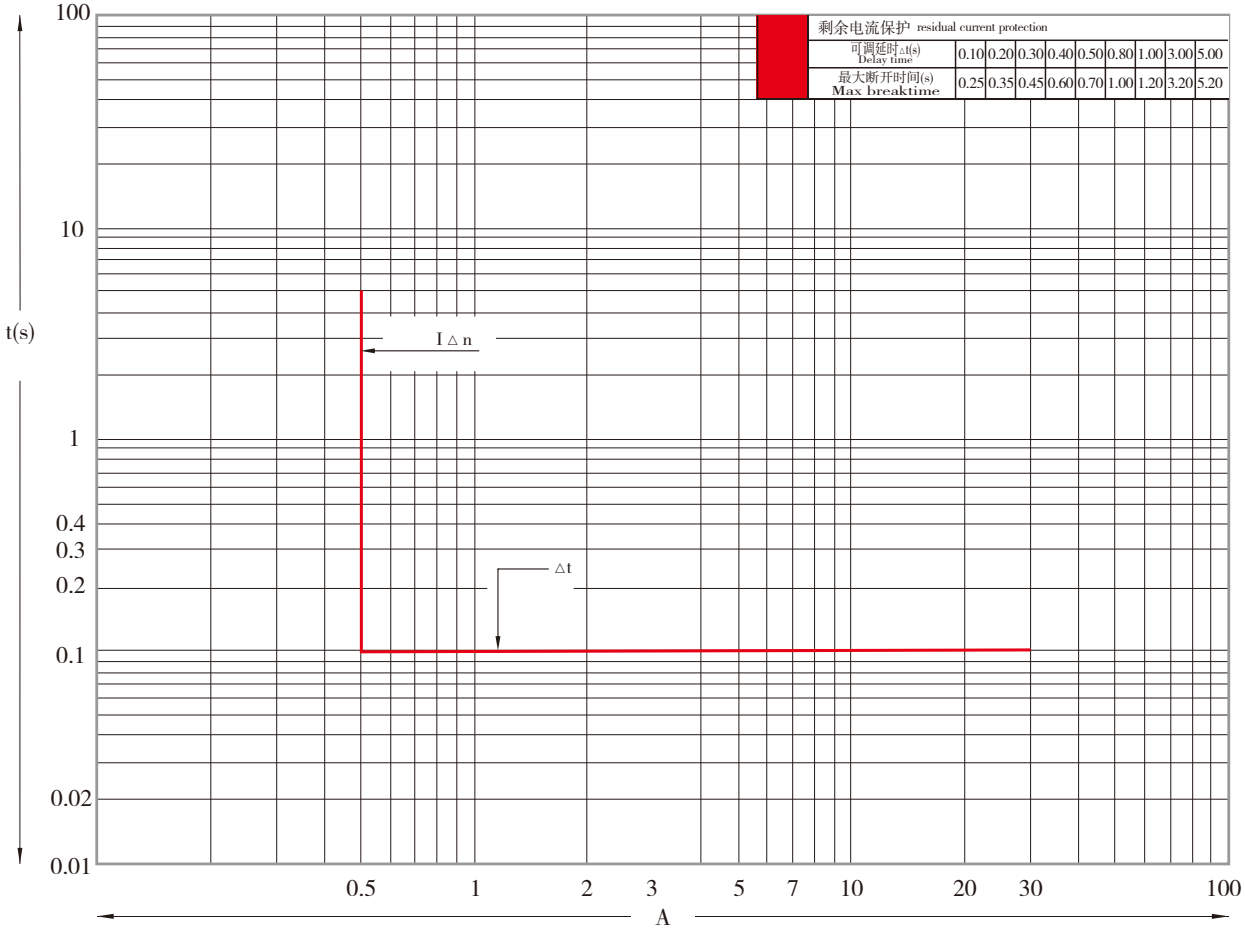


4根120 × 5(mm × mm)母排安装示意
Mounting type for two bars

配CW3V–2000

● 剩余电流保护时间/电流特性曲线

T/I (time/current) curve of residual current protection



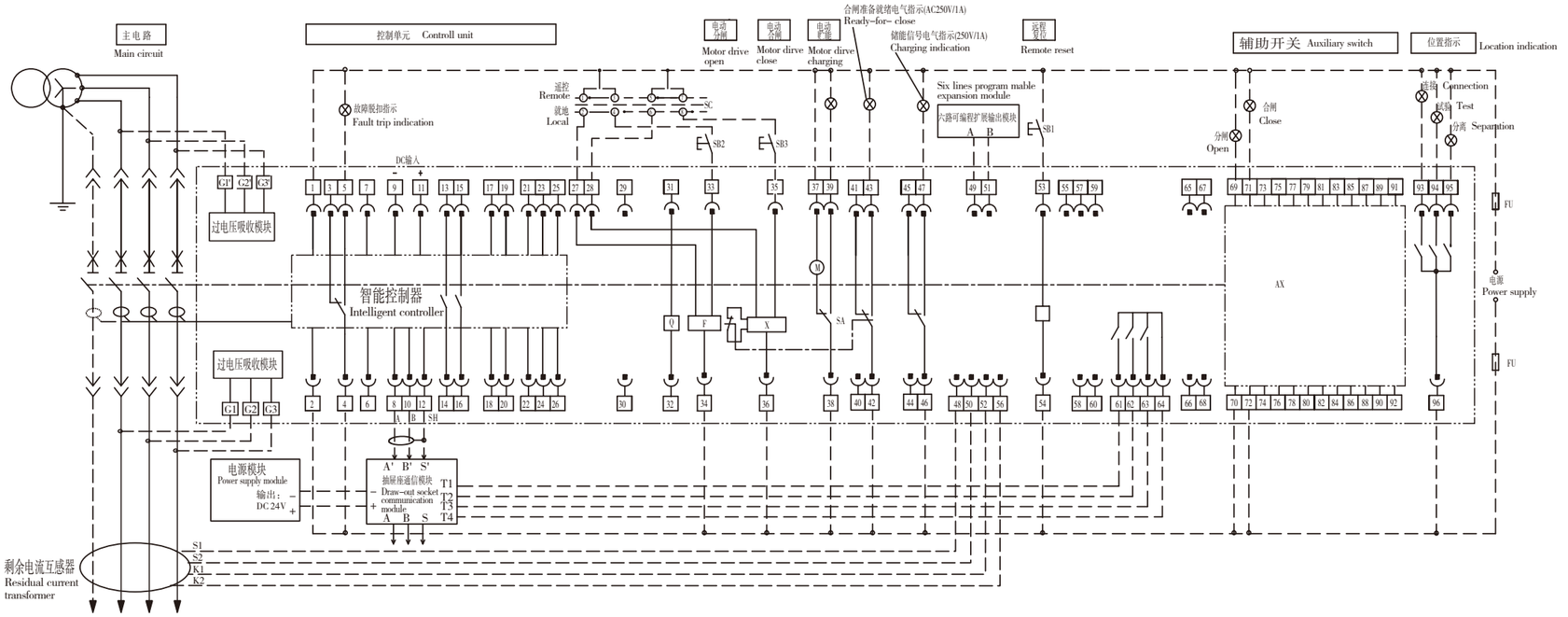

● 智能控制器的剩余电流显示及测量准确度

Residual current indication and accuracy of intellingent controller

| 项目 Item | | 测量范围 Measmenent range | 准确度 Accuracy | | | |
|---|---|---|---|---|---|---|
| | | | EN37 | EA37 | EP37 | EQ37 |
| 剩余电流I△测量 Residual current measurement | 正弦交流AC型 SinusoidalA.C | （0.3~36）A | ± 10% | ± 10% | ± 10% | ± 10% |
| | 交流/脉动直流A型 A.C/Pulasting D.C | | ±（0.2I△n+0.1×读数） | | | |

# CW3V–2000断路器带剩余电流保护二次回路接线图 (智能控制器为EN37、EA37、EP37、EQ37)

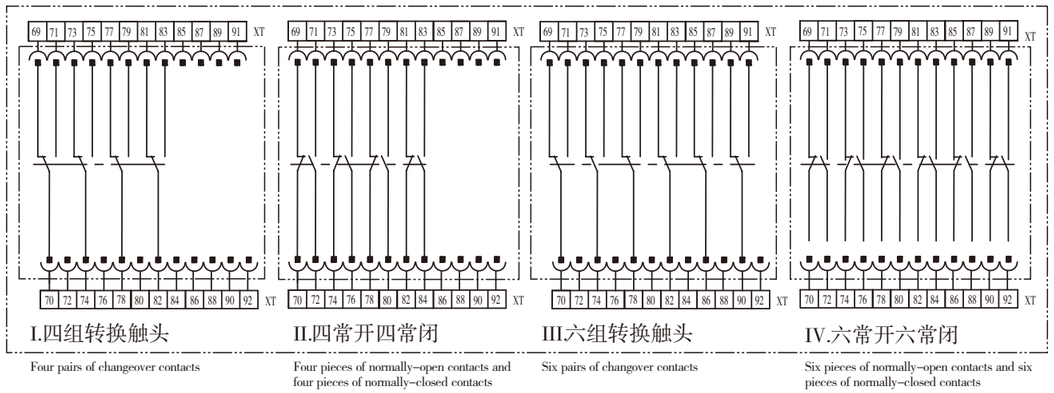
● 断路器二次回路接线图
Wiring diagram of the breaker secondary circuit




| | | |
|---|---|---|
| SB1 | 远程复位按钮 | Remote reset button |
| SB2 | 分励按钮 | Shunt button |
| SB3 | 合闸按钮 | Closing button |
| SC | 转换开关 | chang–over switch |
| Q | 欠电压脱扣器或欠电压延时脱扣器 | Under–voltage release |
| F | 分励脱扣器 | Shunt release |
| X | 合闸电磁铁 | Closing electromagnet |
| M | 贮能电机 | Charging motor |
| SA | 电动机行程开关 | Limit switch |
| XT | 断路器两次回路接线端子 | Terminals |
| FU | 熔断器 | Fuse |
| AX | 断路器辅助开关 | Auxiliary switch |

注：虚线部分由用户自接。若智能控制器、欠电压脱扣器、分励脱扣器、合闸电磁铁等额定电压不同应分别接不同电源。Wiring in the dashed line is done by users themselves. Power supply is different for different rated voltage of controller, Q, F,X etc
下表中，√为必备附件的功能接线；○为选择附件的功能接线；—为无该项功能。In the following table, √: standard configuration , ○: optional configuration, —: none.

辅助开关型式 The pattern of auxiliary switch




特别注意：对剩余电流保护，辅助电源必须接入1、2端子。辅助电源电压为DC110V、220V时，需通过直流电源模块转换成DC24V接入1、2端子。
Specical note: auxiliary power supply must be connected to terminals of 1 and 2 for residual current protection. when the voltage of auxiliary power supply is DC110V or DC220V, DC power supply module should be transformed to DC24V in connection with terminals of 1 and 2.

| 端子号Terminal | 功能Function | | 适用控制器类型 Controller type | | | |
|---|---|---|---|---|---|---|
| | | | EN37 | EA37 | EP37 | EQ37 |
| 1, 2 | 辅助电源 | Auxiliary power supply | √ | √ | √ | √ |
| 3, 4, 5 | 故障指示触点(AC250V 1A) | Fault Instruction (AC250V 1A) | √ | √ | √ | √ |
| 6, 7 | 当三极断路器选择外接中性线电流互感器时，接至外接中性线电流互感器。其中6接互感器端子R，7接互感器端子L。 | Three–pole circuit breaker with current transformer with neutral line N, 6 to R, 7 to L. | ○ | ○ | ○ | ○ |
| 8, 10, 12 | A、B为RS485通信接口，SH接屏蔽层，其中8接A，10接B，12接SH。若有抽屉座通信模块，则接至抽屉座通信模块输入，8接A’，10接B’，12接S’ | A/B is RS485 interface, 8 toA,10 toB,12 to SH<br>If with components of draw–out socket communication module ,8 to A’ , 10 to B’ , 12 to S’ | ○ | ○ | ○ | ○ |
| 9,11 | 通信型断路器需要时接入DC24V电源 9接 “–”，11接 “+” | connecting DC24V power supply if necessary for communicative circuit breaker | ○ | ○ | ○ | ○ |
| 13, 14 | 可编程输出1 | Programmable out 1 | ○ | ○ | ○ | ○ |
| 15, 16 | 可编程输出2 | Programmable out 2 | ○ | ○ | ○ | ○ |
| 17,18,19,20 | 电压显示用A、B、C、N，三相电压输入端，当主回路电压大于AC400V需通过电压转换模块接入 | Voltage display by voltage input of the phases: A, B, C and N, when main voltage is large than AC400V,Voltage changover Module must be selected. | ○ | — | √ | √ |
| 21,22 | ZSI信号输出，21接 “+”，22接 “COM” | ZSI signal output, 21 connecting “+”, 22 connecting “COM” | ○ | ○ | ○ | ○ |
| 23,24 | ZSI信号输入，23接 “+”，24接 “COM” | ZSI signal input, 23 connecting “+”, 24 connecting “COM” | ○ | ○ | ○ | ○ |
| 27 | 遥控分闸时接与33端子同相位电源 | When remote open, connecting terminal 33 | ○ | ○ | ○ | ○ |
| 28 | 遥控合闸时接与35端子同相位电源 | When remote close, connecting terminal 35 | ○ | ○ | ○ | ○ |
| 31, 32 | 欠电压脱扣器（应接在主回路中） | Connect with under–voltage release | ○ | ○ | ○ | ○ |
| 33, 34 | 分励脱扣器 | Connect with shunt release | √ | √ | √ | √ |
| 35, 36 | 合闸电磁铁 | Connect with closing electromagnet | √ | √ | √ | √ |
| 37,38,39 | 电动(电机贮能。37,38可直接接电源（自动预贮能），也可串接常开按钮后接电源（手动预贮能） | Connect with Motor driven operating mechanism, Power supply directly (auto energy prestore) or power supply with a NO(normal open) button simultaneously ( manual energy prestore) with 37,38. | √ | √ | √ | √ |
| 41,42,43 | 合闸准备就绪电气指示 | Ready–for–close indication | ○ | ○ | ○ | ○ |
| 45,46,47 | 储能信号电气指示 | charging indication | ○ | ○ | ○ | ○ |
| 48,50,52,56 | 接剩余电流互感器 | connecting residual current transformer | √ | √ | √ | √ |
| 49,51 | 可编程扩展输出，49接A，51接B | Programmable expansion output, 49 connecting A, 51 connecting B | ○ | ○ | ○ | ○ |
| 53,54 | 远程复位 | Remote reset | ○ | ○ | ○ | ○ |
| 69–92 | 辅助开关连接端子 | Connecting terminals of auxiliary switch | √ | √ | √ | √ |
| 93,96 | 抽屉座 “连接” 位置指示（AC250V 1A） | “Connected” position indication （AC250V 1A） | ○ | ○ | ○ | ○ |
| 94,96 | 抽屉座 “试验” 位置指示（AC250V 1A） | “Test” position indication （AC250V 1A） | ○ | ○ | ○ | ○ |
| 95,96 | 抽屉座 “分离” 位置指示（AC250V 1A） | “Separated” position indication （AC250V 1A） | ○ | ○ | ○ | ○ |
| 61,62,63,64 | 位置信号输出至抽屉座通信模块 | Location signal output to draw–out socket communication Module | ○ | ○ | ○ | ○ |
| T1,T2,T3,T4 | 抽屉座通信模块位置信号输入，81至T1，82至T2，83至T3，84至T4 | Input of draw–out socket commmunication module location Signal, 81 connecting T1,82 connecting T2,83 connecting T3,84 connecting T4 | ○ | ○ | ○ | ○ |
| A, B, S | 抽屉座通信模块通信输出 | Communication output of draw–out socket communication module | ○ | ○ | ○ | ○ |
| A’, B’, S’ | 抽屉座通信模块通信输入,连接本体通信输出,A’ 接8,B’ 接10,S’ 接12 | Communication input of draw–out socket communication module, connect with communication output of the main body, A’ connect with 8, B’ with10, S’ with 12 | ○ | ○ | ○ | ○ |
| S1,S2 | 剩余电流互感器测量输出，S1至48、S2至50 | measurement output of residual current transformer,S1 connecting48、S2 connecting 50 | √ | √ | √ | √ |
| K1,K2 | 剩余电流互感器试验输出，K1至52、K2至56 | test output of residual current transformer, K1 connecting 52、K2 connecting 56 | √ | √ | √ | √ |
| G1，G2，G3 | 接断路器主回路出线端 | To output of breaker's main circuit | ○ | ○ | ○ | ○ |
| G1’，G2’，G3’ | 接断路器主回路进线端 | To input of breaker's main circuit | ○ | ○ | ○ | ○ |

# 断路器订货规范

**断路器订货规范（带EA35或EA36型智能控制器）**（请在___上填上数字，□ 内打上 √）

| | | | | | |
|---|---|---|---|---|---|
| 用户单位 | | 订货台数 | | 订货日期 | |
| 型号 | CW3V– _____ | | | □陆用 | □湿热带型（TH型） |
| 额定电流 | In =_____ A | 额定电压 | □AC400V | □AC690V | □AC1140V |
| 安装方式 | □固定式 | □抽屉式 | | | |
| 联接方式 | □水平 | □垂直 | □上垂直下水平 | □上水平下垂直（仅抽屉式） | |

**智能控制器**

| | | | | | |
|---|---|---|---|---|---|
| 类型选择 | □EA35 | □EA36 | | | |
| 基本功能 | 长延时 Ir1_____ A | t1_____s | 短延时 Ir2_____A | t2 _____s | 瞬时 Ir3_____A |
| | 接地保护 注 | Ir4_____A | t4_____s (仅36型需填) | | |
| | 长延时曲线 | □通用长延时反时限($I^2t$) | □非常反时限(It) | □高压熔丝型($I^4t$) | |
| | N极保护 | □OFF | □50%In | □100%In | □200%In（三极断路器用于2倍相线截面中性线保护） |
| 选择功能 | □过载预报警 | Ir0=_____Ir1 | | | |
| | □电流不平衡 | 动作阈值___% | 动作延时 ___s | 返回阈值___% | 返回延时___s □OFF □报警 □跳闸 |
| | □断相保护 | 动作阈值___% | 动作延时 ___s | 返回阈值___% | 返回延时___s □OFF □报警 □跳闸 |
| | □电流卸载 | 动作阈值___ | 动作延时 ___%$t_1$ | 返回阈值___ | 返回延时 ___s |
| | □通信功能 | 通信协议选择 | 标准型式 | □Modbus | |
| | | | 特殊型式 | □ Profibus | □Devicenet □CAN □WiFi |
| | □ ZSI功能 | | | | |
| 选报警功能时，必须选择2路可编程输出模块（内置）或6路可编程扩展输出模块（外置，见选择附件），并按“可编程输出模块输出编号定义表“选择信号输出。 | | | | | |
| 智能控制器电压 | □AC230V | □AC400V | □DC220V | □DC110V(需配装直流电源模块) | □DC24V （需配专用电源模块） |

**附件配置**

| | | | | | |
|---|---|---|---|---|---|
| FFT 分励脱扣器 | □AC230V | □AC400V | □DC220V | □DC110V | |
| FHD 合闸电磁铁 | □AC230V | □AC400V | □DC220V | □DC110V | |
| FDC 电动操作机构 | □AC230V | □AC400V | □DC220V | □DC110V | |
| FFC 辅助开关 | □4组转换触头 | □4常开4常闭 | 特殊形式 | □6组转换触头 | □6常开6常闭 |
| 过电压吸收模块 | □上进线安装 | □下进线安装 | 特殊形式 | □上/下进线安装 | |

**选择附件**

| | | | | | |
|---|---|---|---|---|---|
| □FQT欠电压脱扣器 | □AC230V | □AC400V | | | |
| | □瞬时型 | 延时型 | □0.5s | □1s | □2s □3s |
| □FFS分闸锁定装置 | □一锁一钥匙 | □二锁一钥匙 | □三锁二钥匙 | | |
| □FLS机械联锁 | 二台断路器 | □钢缆联锁 | □联杆联锁（上下联锁） | | |
| | 三台断路器 | □钢缆联锁方式三 | □联杆联锁方式一 | □联杆联锁方式二 | □联杆联锁方式三 |
| □FAN按钮锁定装置 | □FXG相间隔板 | □FJS计数器 | | | |
| □FHM合闸准备就绪电气指示模块 | □FYF远程复位 | □FWZ抽屉座位置电气指示装置 | □FCZ储能信号电气指示装置 | | |
| □FFJ附件监测单元 | □FBM外接变压器中心点接地单元 | | | | |
| □外接中性线电流互感器 | □FDH–80 | □FDH–120 | □FDH–260 | | |
| □FCM/W32 2路可编程输出模块 | 输出1编号_____类型 _____时间_____ s | 输出2 _____ _____ _____s | | | |
| □FCM/W36 6路可编程扩展输出模块 | 输出1编号 _____类型 _____时间 _____ s | 输出2 _____ _____ _____ s | 输出3 _____ _____ _____ s | | |
| | 输出4编号 _____类型 _____时间 _____ s | 输出5 _____ _____ _____ s | 输出6 _____ _____ _____ s | | |
| 通信功能选件 | □FGT故障脱扣信号 | □FNX储能信号 | □FHX合闸准备就绪信号 | □FQX欠电压输出信号 | □FCT抽屉座通信模块组件（仅适用Modbus协议） |
| □FQY专用电源模块 | □DC24V | | | | |
| □FQY/WT直流电源模块 | □DC110V | □DC220V | | | |
| □FZZ两路电源自动电源转换系统 | 电子型自动转换控制器 □R型 □S型 □F型<br>智能型自动转换控制器 □ZR型 □ZS型 □ZF型<br>智能可通信自动转换控制器 □ZTR型□ZTS型□ZTF型 | | | | |
| □FLZ两进线一母联自动电源转换系统 | 智能型自动转换控制器 □WTT3型<br>智能型带并联转换自动转换控制器 □WTB3型 | □通信 | | | |
| □FLZ三电源自动电源转换系统 | 智能型自动转换控制器 □WTT5型 | □通信 | | | |

注1：接地保护用户可选择矢量和型或变压器中心点接地故障保护。当用户不作选择时，出厂默认矢量和型；当选择变压器中心点接地故障保护时，相应需订购“外接变压器中心点接地单元”（包括接地互感器和接地模块）。注2：所有电源模块电压均为输入电压，输出均为DC24V，用户应根据自己提供的电源电压选择相应的电源模块。若断路器选择了电源模块，则智能控制器的电源电压不作选择。注3、可提供低温至–40℃断路器；注4：选择FLZ自动电源转换系统时断路器标配FAN按钮锁定装置。注5、选择FZZ、FLZ自动电源转换系统时，智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压均为AC230V。

# 断路器订货规范

**断路器订货规范（带EP35、EP36或EQ35、EQ36型智能控制器）**（请在___上填上数字，□ 内打上 √）

| | | | | | |
|---|---|---|---|---|---|
| 用户单位 | | 订货台数 | | 订货日期 | |
| 型号 | CW3V– _____ | | | □陆用 | □湿热带型（TH型） |
| 额定电流 | In = _____A | 额定电压 | □AC400V | □AC690V | □AC1140V |
| 安装方式 | □固定式 | □抽屉式 | | | |
| 联接方式 | □水平 | □垂直 | □上垂直下水平 | □上水平下垂直（仅抽屉式） | |

**智能控制器**

类型选择 □EP35 □EP36 □EQ35 □EQ36

**基本功能**

- 长延时 $I_{r1}$_____A $t_1$_____ s 短延时 $I_{r2}$_____ A $t_2$_____ s 瞬时 $I_{r3}$_____A
- 接地保护 注 $I_{r4}$ ____ A $t_4$_____ s (仅36型需填)
- 长延时曲线 □通用长延时反时限($I^2t$) □非常反时限(It) □高压熔丝型($I^4t$)
- N极保护整定值 □OFF □50%In □100%In □200%In（三极断路器用于2倍相线截面中性线保护）

**选择功能**

- □过载预报警 $I_{r0}$= _____ $I_{r1}$
- □电流不平衡 动作阈值___% 动作延时___s 返回阈值___% 返回延时___s □OFF □报警 □跳闸
- □断相保护 动作阈值___% 动作延时___s 返回阈值___% 返回延时___s □OFF □报警 □跳闸
- □需用电流保护 动作阈值___ 动作延时___s 返回阈值___ 返回延时___s □OFF □报警 □跳闸
- □低电压保护 动作阈值___ 动作延时___s 返回阈值___ 返回延时___s □OFF □报警 □跳闸
- □过电压保护 动作阈值___ 动作延时___s 返回阈值___ 返回延时___s □OFF □报警 □跳闸
- □电压不平衡 动作阈值___% 动作延时___s 返回阈值___% 返回延时___s □OFF □报警 □跳闸
- □相序保护 动作阈值___ 动作延时0.3s □OFF □报警 □跳闸
- □电流卸载 动作阈值___ 动作延时 ___%$t_1$ 返回阈值___ 返回延时___s
- □通信功能 | 通信协议选择 | 标准型式 □Modbus
  特殊型式 □ Profibus □Devicenet □CAN □WiFi
- □ ZSI功能

选报警功能时，必须选择2路可编程输出模块（内置）或6路可编程扩展输出模块（外置，见选择附件），并按“可编程输出模块输出编号定义表“选择信号输出。

智能控制器电压 □AC230V □AC400V | □DC220V □DC110V(需配装直流电源模块) | □DC24V （需配专用电源模块）

**附件配置**

- FFT分励脱扣器 □AC230V □AC400V □DC220V □DC110V
- FHD合闸电磁铁 □AC230V □AC400V □DC220V □DC110V
- FDC电动操作机构 □AC230V □AC400V □DC220V □DC110V
- FFC辅助开关 □4组转换触头 □4常开4常闭 | 特殊形式 □6组转换触头 □6常开6常闭
- 过电压吸收模块 □上进线安装 □下进线安装 | 特殊形式 □上/下进线安装

**选择附件**

- □FQT欠电压脱扣器 □AC230V □AC400V
  □瞬时型 | 延时型 □0.5s □1s □2s □3s
- □FFS分闸锁定装置 □一锁一钥匙 □二锁一钥匙 □三锁二钥匙
- □FLS机械联锁 二台断路器 □钢缆联锁 □联杆联锁（上下联锁）
  三台断路器 □钢缆联锁方式三 □联杆联锁方式一 □联杆联锁方式二 □联杆联锁方式三
- □FAN按钮锁定装置 □FXG相间隔板 □FJS计数器
- □FHM合闸准备就绪电气指示模块 □FYF远程复位 □FWZ抽屉座位置电气指示装置 □FCZ储能信号电气指示装置
- □FFJ附件监测单元 □FBM外接变压器中心点接地单元
- □外接中性线电流互感器 □FDH–80 □FDH–120 □FDH–260
- □FCM/W32 2路可编程输出模块 输出1编号_____类型_____时间_____s 输出2____ ____ ____ s
- □FCM/W36 6路可编程扩展输出模块 输出1编号_____类型 ____时间 ____ s 输出2 ____ ____ ____ s 输出3 ____ ____ ____ s
  输出4编号_____类型 ____时间 ____ s 输出5 ____ ____ ____ s 输出6 ____ ____ ____ s
- 通信功能选件 □FGT故障脱扣信号 □FNX储能信号 □FHX合闸准备就绪信号 □FQX欠电压输出信号 □FCT抽屉座通信模块组件（仅适用Modbus协议）
- □FDY专用电源模块 □DC24V
- □FDY/WT直流电源模块 □DC110V □DC220V
- □FZZ两路电源自动电源转换系统 电子型自动转换控制器 □R型 □S型 □F型
  智能型自动转换控制器 □ZR型 □ZS型 □ZF型
  智能可通信自动转换控制器 □ZTR型□ZTS型□ZTF型
- □FLZ两进线一母联自动电源转换系统 智能型自动转换控制器 □WTT3型
  智能型带并联转换自动转换控制器 □WTB3型 | □通信
- □FLZ三电源自动电源转换系统 智能型自动转换控制器 □WTT5型 | □通信

注1：接地保护用户可选择矢量和型或变压器中心点接地故障保护。当用户不作选择时，出厂默认矢量和型；当选择变压器中心点接地故障保护时，相应需订购“外接变压器中心点接地单元”（包括接地互感器和接地模块）。注2：所有电源模块电压均为输入电压，输出均为DC24V，用户应根据自己提供的电源电压选择相应的电源模块。若断路器选择了电源模块，则智能控制器的电源电压不作选择。注3、可提供低温至–40℃断路器；注4：选择FLZ自动电源转换系统时断路器标配FAN按钮锁定装置。注5、选择FZZ、FLZ自动电源转换系统时，智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压均为AC230V。

# 断路器订货规范

**断路器订货规范（带EG35或EG36型智能控制器）**（请在___上填上数字，□ 内打上 √）

| | | | | | |
|---|---|---|---|---|---|
| 用户单位 | | 订货台数 | | 订货日期 | |
| 型号 | CW3V– _____ | | | □陆用 | □湿热带型（TH型） |
| 额定电流 | In = _____A | 额定电压 | □AC400V □AC690V □AC1140V | | |
| 安装方式 | □固定式 □抽屉式 | | | | |
| 联接方式 | □水平 □垂直 □上垂直下水平 □上水平下垂直（仅抽屉式） | | | | |

**智能控制器**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 类型选择 | □发电机保护型EG35 | □发电机保护型EG36 | | | | | |
| 基本功能 | 长延时 $I_{r1}$_____A | $t_1$_____s | 短延时 $I_{r2}$_____A | $t_2$ _____s | 瞬时 $I_{r3}$_____A | | |
| | 接地保护 | $I_{r4}$ ____ A | $t_4$ _____ s (仅36型需填) | | | | |
| | 欠频保护 | 动作阈值 ___ | 动作延时___ s | 返回阈值___ | 返回延时___s | □OFF | □报警 □跳闸 |
| | 过频保护 | 动作阈值 ___ | 动作延时___ s | 返回阈值___ | 返回延时___s | □OFF | □报警 □跳闸 |
| | 逆功率保护 | 动作阈值 ___ | 动作延时___ s | 返回阈值___ | 返回延时___ s | □OFF | □报警 □跳闸 |
| | N极保护 | □OFF | □50%In | □100%In | | | |
| 选择功能 | □过载预报警 | $I_{r0}$= _____ $I_{r1}$ | | | | | |
| | □电流不平衡 | 动作阈值___% | 动作延时___s | 返回阈值___% | 返回延时___s | □OFF | □报警 □跳闸 |
| | □断相保护 | 动作阈值___% | 动作延时___s | 返回阈值___% | 返回延时___s | □OFF | □报警 □跳闸 |
| | □需用电流保护 | 动作阈值___ | 动作延时___s | 返回阈值___ | 返回延时___s | □OFF | □报警 □跳闸 |
| | □低电压保护 | 动作阈值___ | 动作延时___s | 返回阈值___ | 返回延时___s | □OFF | □报警 □跳闸 |
| | □过电压保护 | 动作阈值___ | 动作延时___s | 返回阈值___ | 返回延时___s | □OFF | □报警 □跳闸 |
| | □电压不平衡 | 动作阈值___% | 动作延时___s | 返回阈值___% | 返回延时___s | □OFF | □报警 □跳闸 |
| | □相序保护 | 动作阈值___ | 动作延时 0.3s | | | □OFF | □报警 □跳闸 |
| | □电流卸载 | 动作阈值___ | 动作延时 ___%$t_1$ | 返回阈值___ | 返回延时___s | | |
| | □通信功能 | 通信协议选择 | 标准型式 □Modbus | | | | |
| | | | 特殊型式 □ Profibus □Devicenet □CAN □WiFi | | | | |
| | □ ZSI功能 | | | | | | |

选报警功能时，必须选择2路可编程输出模块（内置）或6路可编程扩展输出模块（外置，见选择附件），并按“可编程输出模块输出编号定义表“选择信号输出。

| | | | |
|---|---|---|---|
| 智能控制器电压 | □AC230V □AC400V | □DC220V □DC110V(需配装直流电源模块) | □DC24V （需配专用电源模块） |

**附件配置**

| | | | | |
|---|---|---|---|---|
| FFT分励脱扣器 | □AC230V | □AC400V | □DC220V | □DC110V |
| FHD合闸电磁铁 | □AC230V | □AC400V | □DC220V | □DC110V |
| FDC电动操作机构 | □AC230V | □AC400V | □DC220V | □DC110V |
| FFC辅助开关 | □4组转换触头 | □4常开4常闭 | 特殊形式 | □6组转换触头 □6常开6常闭 |
| 过电压吸收模块 | □上进线安装 | □下进线安装 | 特殊形式 | □上/下进线安装 |

**选择附件**

| | | | | | | |
|---|---|---|---|---|---|---|
| □FQT欠电压脱扣器 | □AC230V | □AC400V | | | | |
| | □瞬时型 | 延时型 | □0.5s | □1s | □2s | □3s |
| □FFS分闸锁定装置 | □一锁一钥匙 | □二锁一钥匙 | □三锁二钥匙 | | | |
| □FLS机械联锁 | 二台断路器 | □钢缆联锁 | □联杆联锁（上下联锁） | | | |
| | 三台断路器 | □钢缆联锁方式三 | □联杆联锁方式一 | □联杆联锁方式二 | □联杆联锁方式三 | |
| □FAN按钮锁定装置 | □FXG相间隔板 | □FJS计数器 | | | | |
| □FHM合闸准备就绪电气指示模块 | □FYF远程复位 | □FWZ抽屉座位置电气指示装置 | □FCZ储能信号电气指示装置 | | | |
| □FFJ附件监测单元 | □外接中性线电流互感器 | □FDH–80 | □FDH–120 | □FDH–260 | | |
| □FCM/W32 2路可编程输出模块 | 输出1编号_____类型_____时间_____s | 输出2 ___ ___ ___s | | | | |
| □FCM/W36 6路可编程扩展输出模块 | 输出1编号_____ 类型 ____时间 ____ s | 输出2 ____ ____ ____ s | 输出3 ____ ____ ____ s | | | |
| | 输出4编号_____ 类型 ____时间 ____ s | 输出5 ____ ____ ____ s | 输出6 ____ ____ ____ s | | | |
| 通信功能选件 □FGT故障脱扣信号 □FNX储能信号 □FHX合闸准备就绪信号 □FQX欠电压输出信号 □FCT抽屉座通信模块组件（仅适用Modbus协议） | | | | | | |
| □FDY专用电源模块 | □DC24V | | | | | |
| □FDY/WT直流电源模块 | □DC110V | □DC220V | | | | |
| □FZZ两路电源自动电源转换系统 | 电子型自动转换控制器 □R型 □S型 □F型<br>智能型自动转换控制器 □ZR型 □ZS型 □ZF型<br>智能可通信自动转换控制器 □ZTR型□ZTS型□ZTF型 | | | | | |
| □FLZ两进线一母联自动电源转换系统 | 智能型自动转换控制器 □WTT3型<br>智能型带并联转换自动转换控制器 □WTB3型 | □通信 | | | | |
| □FLZ三电源自动电源转换系统 | 智能型自动转换控制器 □WTT5型 | □通信 | | | | |

注1：所有电源模块电压均为输入电压，输出均为DC24V，用户应根据自己提供的电源电压选择相应的电源模块。若断路器选择了电源模块，则智能控制器的电源电压不作选择。注2、可提供低温至–40℃断路器；注3：选择FLZ自动电源转换系统时断路器标配FAN按钮锁定装置。注4、选择FZZ、FLZ自动电源转换系统时，智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压均为AC230V。

# 断路器订货规范

**断路器订货规范（带EN35、EN36型智能控制器）**（请在___上填上数字，□ 内打上 √）

| | | | | | |
|---|---|---|---|---|---|
| 用户单位 | | 订货台数 | | 订货日期 | |
| 型号 | CW3V– _____ | | | □陆用 | □湿热带型（TH型） |
| 额定电流 | In =_____ A | 额定电压 | □AC400V | □AC690V | □AC1140V |
| 安装方式 | □固定式 | □抽屉式 | | | |
| 联接方式 | □水平 | □垂直 | □上垂直下水平 | □上水平下垂直（仅抽屉式） | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 智能控制器 | 类型选择 | □EN35 | □EN36 | | | |
| | 基本功能 | 长延时 Ir1_____ A | t1_____s | 短延时 Ir2_____A | t2 _____s | 瞬时 Ir3_____A |
| | | 接地保护[注] | Ir4_____A | t4 _____s （仅36型需填） | | |
| | | 长延时曲线 | □通用长延时反时限($I^2t$) | | | |
| | | N极保护整定值 | □OFF □50%In □100%In | □200%In（三极断路器用于2倍相线截面中性线保护） | | |
| | 选择功能 | □过载预报警 | Ir0=_____Ir1 | | | |
| | | □电流不平衡 | 动作阈值___% | 动作延时 ___s | 返回阈值___% | 返回延时___s □OFF □报警 □跳闸 |
| | | □断相保护 | 动作阈值___% | 动作延时 ___s | 返回阈值___% | 返回延时___s □OFF □报警 □跳闸 |
| | | □电流卸载 | 动作阈值___ | 动作延时 ___%$t_1$ | 返回阈值___ | 返回延时___s |
| | | □功率电能测量 | | | | |
| | | □通信功能 | 通信协议选择 | 标准型式 □Modbus | | |
| | | | | 特殊型式 □ Profibus □Devicenet □CAN □WiFi | | |
| | | □ ZSI功能 | | | | |
| | 选报警功能时，必须选择2路可编程输出模块（内置）或6路可编程扩展输出模块（外置，见选择附件），并按“可编程输出模块输出编号定义表“选择信号输出。 | | | | | |
| | 智能控制器电压 | □AC230V | □AC400V | □DC220V | □DC110V(需配装直流电源模块) | □DC24V （需配专用电源模块） |
| 附件配置 | FFT分励脱扣器 | □AC230V | □AC400V | □DC220V | □DC110V | |
| | FHD合闸电磁铁 | □AC230V | □AC400V | □DC220V | □DC110V | |
| | FDC电动操作机构 | □AC230V | □AC400V | □DC220V | □DC110V | |
| | FFC辅助开关 | □4组转换触头 | □4常开4常闭 | 特殊形式 | □6组转换触头 | □6常开6常闭 |
| | 过电压吸收模块 | □上进线安装 | □下进线安装 | 特殊形式 | □上/下进线安装 | |
| 选择附件 | □FQT欠电压脱扣器 | □AC230V | □AC400V | | | |
| | | □瞬时型 | 延时型 | □0.5s □1s □2s □3s | | |
| | □FFS分闸锁定装置 | □一锁一钥匙 | □二锁一钥匙 | □三锁二钥匙 | | |
| | □FLS机械联锁 | 二台断路器 | □钢缆联锁 | □联杆联锁（上下联锁） | | |
| | | 三台断路器 | □钢缆联锁方式三 | □联杆联锁方式一 | □联杆联锁方式二 | □联杆联锁方式三 |
| | □FAN按钮锁定装置 | □FXG相间隔板 | □FJS计数器 | | | |
| | □FHM合闸准备就绪电气指示模块 | □FYF远程复位 | □FWZ抽屉座位置电气指示装置 | □FCZ储能信号电气指示装置 | | |
| | □FFJ附件监测单元 | □FBM外接变压器中心点接地单元 | | | | |
| | □外接中性线电流互感器 | □FDH–80 | □FDH–120 | □FDH–260 | | |
| | □FCM/W32 2路可编程输出模块 | 输出1编号____类型 ____时间 ____ s | 输出2 ____ ____ ____ s | | | |
| | □FCM/W36 6路可编程扩展输出模块 | 输出1编号 ____ 类型 ____ 时间 ____ s | 输出2 ____ ____ ____ s | 输出3 ____ ____ ____ s | | |
| | | 输出4编号 ____ 类型 ____ 时间 ____ s | 输出5 ____ ____ ____ s | 输出6 ____ ____ ____ s | | |
| | 通信功能选件 | □FGT故障脱扣信号 | □FNX储能信号 | □FHX合闸准备就绪信号 | □FQX欠电压输出信号 | □FCT抽屉座通信模块组件（仅适用Modbus协议） |
| | □FDY专用电源模块 | □DC24V | | | | |
| | □FDY/WT直流电源模块 | □DC110V | □DC220V | | | |
| | □FZZ两路电源自动电源转换系统 | 电子型自动转换控制器 □R型 □S型 □F型<br>智能型自动转换控制器 □ZR型 □ZS型 □ZF型<br>智能可通信自动转换控制器 □ZTR型□ZTS型□ZTF型 | | | | |
| | □FLZ两进线一母联自动电源转换系统 | 智能型自动转换控制器 □WTT3型<br>智能型带并联转换自动转换控制器 □WTB3型 | □通信 | | | |
| | □FLZ三电源自动电源转换系统 | 智能型自动转换控制器 □WTT5型 | □通信 | | | |

注1：接地保护用户可选择矢量和型或变压器中心点接地故障保护。当用户不作选择时，出厂默认矢量和型；当选择变压器中心点接地故障保护时，相应需订购“外接变压器中心点接地单元”（包括接地互感器和接地模块）。注2：所有电源模块电压均为输入电压，输出均为DC24V，用户应根据自己提供的电源电压选择相应的电源模块。若断路器选择了电源模块，则智能控制器的电源电压不作选择。注3、可提供低温至–40℃断路器；注4：选择FLZ自动电源转换系统时断路器标配FAN按钮锁定装置。注5、选择FZZ、FLZ自动电源转换系统时，智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压均为AC230V。

# 断路器订货规范

**断路器订货规范（带EA37型智能控制器）**　（请在___上填上数字，□ 内打上 √）

| | | | | | |
|---|---|---|---|---|---|
| 用户单位 | | 订货台数 | | 订货日期 | |

型号　□ CW3V-2000　□陆用　□湿热带型（TH型）

额定电流　In =_____ A　额定电压　□AC400V　□AC690V　□AC1140V

安装方式　□固定式　□抽屉式

联接方式　□水平　□垂直　□上垂直下水平　□上水平下垂直（仅抽屉式）

**智能控制器**

类型选择　□EA37

**基本功能**

长延时 Ir1_____A　t1_____s　短延时 Ir2_____A　t2 _____s　瞬时　Ir3_____A

剩余电流保护I△n_____A　△t _____s　□跳闸　□跳闸并报警

长延时曲线　□通用长延时反时限($I^2t$)　□非常反时限(It)　□高压熔丝型($I^4t$)

N极保护　□OFF　□50%In　□100%In　□200%In（三极断路器用于2倍相线截面中性线保护）

**选择功能**

□过载预报警　Ir0=_____Ir1

□电流不平衡　动作阈值___%　动作延时 ___s　返回阈值___%　返回延时___s　□OFF　□报警　□跳闸

□断相保护　动作阈值___%　动作延时 ___s　返回阈值___%　返回延时___s　□OFF　□报警　□跳闸

□电流卸载　动作阈值___动作延时 ___%t1　返回阈值___ 返回延时___s

□通信功能　通信协议选择　标准型式　□Modbus

特殊型式　□Profibus　□Devicenet　□CAN　□WiFi

□ ZSI功能

选报警功能时，必须选择2路可编程输出模块（内置）或6路可编程扩展输出模块（外置，见选择附件），并按“可编程输出模块输出编号定义表“选择信号输出。

智能控制器电压　□AC230V　□AC400V　□DC220V　□DC110V（需配装直流电源模块）　□DC24V（需配专用电源模块）

**附件配置**

FFT分励脱扣器　□AC230V　□AC400V　□DC220V　□DC110V

FHD合闸电磁铁　□AC230V　□AC400V　□DC220V　□DC110V

FDC电动操作机构　□AC230V　□AC400V　□DC220V　□DC110V

FFC辅助开关　□4组转换触头　□4常开4常闭　特殊形式　□6组转换触头　□6常开6常闭

**选择附件**

□FQT欠电压脱扣器　□AC230V　□AC400V

□瞬时型　延时型　□0.5s　□1s　□2s　□3s

□FFS分闸锁定装置　□一锁一钥匙　□二锁一钥匙　□三锁二钥匙

□FLS机械联锁　二台断路器　□钢缆联锁　□联杆联锁（上下联锁）

三台断路器　□钢缆联锁方式三　□联杆联锁方式一　□联杆联锁方式二　□联杆联锁方式三

□FAN按钮锁定装置　□FXG相间隔板　□FJS计数器

□FHM合闸准备就绪电气指示模块□FYF远程复位 □FWZ抽屉座位置电气指示装置□FCZ储能信号电气指示装置

□FFJ附件监测单元

□外接中性线电流互感器　□FDH-80　□FDH-120　□FDH-260

□FCM/W32　2路可编程输出模块　输出1编号___类型 ___时间 ___ s　输出2 ____ ____ ____ s

□FCM/W36 6路可编程扩展输出模块　输出1编号 ____ 类型 ____时间 ____ s　输出2 ____ ____ ____ s　输出3 ____ ____ ____ s

输出4编号 ____ 类型 ____时间 ____ s　输出5 ____ ____ ____ s　输出6 ____ ____ ____ s

通信功能选件　□FGT故障脱扣信号　□FNX储能信号　□FHX合闸准备就绪信号　□FQX欠电压输出信号　□FCT抽屉座通信模块组件（仅适用Modbus协议）

□FDY专用电源模块　□DC24V

□FDY/WT直流电源模块　□DC110V　□DC220V

□FZZ两路电源自动电源转换系统　电子型自动转换控制器 □R型 □S型 □F型

智能型自动转换控制器 □ZR型 □ZS型 □ZF型

智能可通信自动转换控制器 □ZTR型□ZTS型□ZTF型

□FLZ两进线一母联自动电源转换系统　智能型自动转换控制器 □WTT3型

智能型带并联转换自动转换控制器 □WTB3型　□通信

□FLZ三电源自动电源转换系统　智能型自动转换控制器 □WTT5型　□通信

注1：所有电源模块电压均为输入电压，输出均为DC24V，用户应根据自己提供的电源电压选择相应的电源模块。若断路器选择了电源模块，则智能控制器的电源电压不作选择。注2：剩余电流保护功能选择“跳闸并报警”时剩余电流故障报警信号通过“2路可编程输出模块”输出，其他选择功能报警信号需通过“6路可编程扩展模块”输出。注3：可提供低温至-40℃断路器。注4：选择FLZ自动电源转换系统时断路器标配FAN按钮锁定装置。注5、选择FZZ、FLZ自动电源转换系统时，智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压均为AC230V。

# 断路器订货规范

**断路器订货规范（带EP37或EQ37型智能控制器）**（请在___上填上数字，□ 内打上 √）

| | | | | | |
|---|---|---|---|---|---|
| 用户单位 | | 订货台数 | | 订货日期 | |
| 型号 | □ CW3V-2000 | | | □陆用 | □湿热带型（TH型） |
| 额定电流 | In = _____A | | 额定电压 | □AC400V | □AC690V □AC1140V |
| 安装方式 | □固定式 | □抽屉式 | | | |
| 联接方式 | □水平 | □垂直 | □上垂直下水平 | □上水平下垂直（仅抽屉式） | |

**智能控制器**

类型选择 □EP37 □EQ37

**基本功能**

- 长延时 $Ir_1$_____A $t_1$_____ s 短延时 $Ir_2$_____ A $t_2$_____ s 瞬时 $Ir_3$_____A
- 剩余电流保护I△n ____ A △t ____ s □跳闸 □跳闸并报警
- 长延时曲线 □通用长延时反时限($I^2t$) □非常反时限(It) □高压熔丝型($I^4t$)
- N极保护整定值 □OFF □50%In □100%In □200%In（三极断路器用于2倍相线截面中性线保护）

**选择功能**

- □过载预报警 $Ir_0$= _____ $Ir_1$
- □电流不平衡 动作阈值___% 动作延时___s 返回阈值___% 返回延时___s □OFF □报警 □跳闸
- □断相保护 动作阈值___% 动作延时___s 返回阈值___% 返回延时___s □OFF □报警 □跳闸
- □需用电流保护 动作阈值___ 动作延时___s 返回阈值___ 返回延时___s □OFF □报警 □跳闸
- □低电压保护 动作阈值___ 动作延时___s 返回阈值___ 返回延时___s □OFF □报警 □跳闸
- □过电压保护 动作阈值___ 动作延时___s 返回阈值___ 返回延时___s □OFF □报警 □跳闸
- □电压不平衡 动作阈值___% 动作延时___s 返回阈值___% 返回延时___s □OFF □报警 □跳闸
- □相序保护 动作阈值___ 动作延时0.3s □OFF □报警 □跳闸
- □电流卸载 动作阈值___动作延时 ___%$t_1$ 返回阈值___ 返回延时___s
- □通信功能 | 通信协议选择 | 标准型式 □Modbus；特殊型式 □Profibus □Devicenet □CAN □WiFi
- □ ZSI功能

选报警功能时，必须选择2路可编程输出模块（内置）或6路可编程扩展输出模块（外置，见选择附件），并按“可编程输出模块输出编号定义表”选择信号输出。

智能控制器电压 □AC230V □AC400V | □DC220V □DC110V(需配装直流电源模块) | □DC24V (需配专用电源模块)

**附件配置**

- FFT分励脱扣器 □AC230V □AC400V □DC220V □DC110V
- FHD合闸电磁铁 □AC230V □AC400V □DC220V □DC110V
- FDC电动操作机构 □AC230V □AC400V □DC220V □DC110V
- FFC辅助开关 □4组转换触头 □4常开4常闭 | 特殊形式 □6组转换触头 □6常开6常闭

**选择附件**

- □FQT欠电压脱扣器 □AC230V □AC400V；□瞬时型 | 延时型 □0.5s □1s □2s □3s
- □FFS分闸锁定装置 □一锁一钥匙 □二锁一钥匙 □三锁二钥匙
- □FLS机械联锁 二台断路器 □钢缆联锁 □联杆联锁（上下联锁）；三台断路器 □钢缆联锁方式三 □联杆联锁方式一 □联杆联锁方式二 □联杆联锁方式三
- □FAN按钮锁定装置 □FXG相间隔板 □FJS计数器
- □FHM合闸准备就绪电气指示模块 □FYF远程复位 □FWZ抽屉座位置电气指示装置 □FCZ储能信号电气指示装置
- □FFJ附件监测单元
- □外接中性线电流互感器 □FDH-80 □FDH-120 □FDH-260
- □FCM/W32 2路可编程输出模块 输出1编号____类型____时间 ____ s 输出2____ ____ ____ s
- □FCM/W36 6路可编程扩展输出模块 输出1编号_____ 类型 ____ 时间 ____ s 输出2 ____ ____ ____ s 输出3 ____ ____ ____ s；输出4编号_____ 类型 ____ 时间 ____ s 输出5 ____ ____ ____ s 输出6 ____ ____ ____ s
- 通信功能选件 □FGT故障脱扣信号 □FNX储能信号 □FHX合闸准备就绪信号 □FQX欠电压输出信号 □FCT抽屉座通信模块组件（仅适用Modbus协议）
- □FDY专用电源模块 □DC24V
- □FDY/WT直流电源模块 □DC110V □DC220V
- □FZZ两路电源自动电源转换系统：电子型自动转换控制器 □R型 □S型 □F型；智能型自动转换控制器 □ZR型 □ZS型 □ZF型；智能可通信自动转换控制器 □ZTR型□ZTS型□ZTF型
- □FLZ两进线一母联自动电源转换系统：智能型自动转换控制器 □WTT3型；智能型带并联转换自动转换控制器 □WTB3型 | □通信
- □FLZ三电源自动电源转换系统：智能型自动转换控制器 □WTT5型 | □通信

注1：所有电源模块电压均为输入电压，输出均为DC24V，用户应根据自己提供的电源电压选择相应的电源模块。若断路器选择了电源模块，则智能控制器的电源电压不作选择。注2：剩余电流保护功能选择“跳闸并报警”时剩余电流故障报警信号通过“2路可编程输出模块”输出，其他选择功能报警信号需通过“6路可编程扩展模块”输出。注3：可提供低温至-40℃断路器。注4：选择FLZ自动电源转换系统时断路器标配FAN按钮锁定装置。注5、选择FZZ、FLZ自动电源转换系统时，智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压均为AC230V。

# 断路器订货规范

**断路器订货规范（带EN37智能控制器）**（请在___上填上数字，□ 内打上 √）

| | | | | | |
|---|---|---|---|---|---|
| 用户单位 | | 订货台数 | | 订货日期 | |
| 型号 | □ CW3V-2000 | | | □陆用 | □湿热带型（TH型） |
| 额定电流 | In =_____ A | 额定电压 | □AC400V | □AC690V | □AC1140V |
| 安装方式 | □固定式 | □抽屉式 | | | |
| 联接方式 | □水平 | □垂直 | □上垂直下水平 | □上水平下垂直（仅抽屉式） | |
| 智能控制器 基本功能 | 类型选择 | □EN37 | | | |
| | 长延时 Ir1_____A | t1_____s | 短延时 Ir2_____A | t2 _____s | 瞬时 Ir3_____A |
| | 剩余电流保护I△n ___ A | △t ____ s | □跳闸 | □跳闸并报警 | |
| | 长延时曲线 | □通用长延时反时限($I^2t$) | | | |
| | N极保护整定值 | □OFF | □50%In | □100%In | □200%In（三极断路器用于2倍相线截面中性线保护） |
| 智能控制器 选择功能 | □过载预报警 | Ir0=_____Ir1 | | | |
| | □电流不平衡 | 动作阈值___% | 动作延时 ___s | 返回阈值___% | 返回延时___s □OFF □报警 □跳闸 |
| | □断相保护 | 动作阈值___% | 动作延时 ___s | 返回阈值___% | 返回延时___s □OFF □报警 □跳闸 |
| | □电流卸载 | 动作阈值___ | 动作延时 ___%t1 | 返回阈值___ | 返回延时___s |
| | □功率电能测量 | | | | |
| | □通信功能 | 通信协议选择 | 标准型式 | □Modbus | |
| | | | 特殊型式 | □Profibus □Devicenet □CAN □WiFi | |
| | □ ZSI功能 | | | | |
| | 选报警功能时，必须选择2路可编程输出模块（内置）或6路可编程扩展输出模块（外置，见选择附件），并按“可编程输出模块输出编号定义表“选择信号输出。 | | | | |
| | 智能控制器电压 □AC230V □AC400V | | □DC220V □DC110V（需配装直流电源模块） | | □DC24V（需配专用电源模块） |
| 附件配置 | FFT分励脱扣器 | □AC230V | □AC400V | □DC220V | □DC110V |
| | FHD合闸电磁铁 | □AC230V | □AC400V | □DC220V | □DC110V |
| | FDC电动操作机构 | □AC230V | □AC400V | □DC220V | □DC110V |
| | FFC辅助开关 | □4组转换触头 | □4常开4常闭 | 特殊形式 | □6组转换触头 □6常开6常闭 |
| 选择附件 | □FQT欠电压脱扣器 | □AC230V | □AC400V | | |
| | | □瞬时型 | 延时型 | □0.5s □1s □2s □3s | |
| | □FFS分闸锁定装置 | □一锁一钥匙 | □二锁一钥匙 | □三锁二钥匙 | |
| | □FLS机械联锁 | 二台断路器 | □钢缆联锁 | □联杆联锁（上下联锁） | |
| | | 三台断路器 | □钢缆联锁方式三 | □联杆联锁方式一 | □联杆联锁方式二 □联杆联锁方式三 |
| | □FAN按钮锁定装置 | □FXG相间隔板 | □FJS计数器 | | |
| | □FHM合闸准备就绪电气指示模块 | □FYF远程复位 | □FWZ抽屉座位置电气指示装置 | □FCZ储能信号电气指示装置 | |
| | □FFJ附件监测单元 | | | | |
| | □外接中性线电流互感器 | □FDH-80 | □FDH-120 | □FDH-260 | |
| | □FCM/W32 2路可编程输出模块 | 输出1编号___类型 ___时间 ___s | 输出2 ___ ___ ___ s | | |
| | □FCM/W36 6路可编程扩展输出模块 | 输出1编号 ___ 类型 ___ 时间 ___ s | 输出2 ___ ___ ___ s | 输出3 ___ ___ ___ s | |
| | | 输出4编号 ___ 类型 ___ 时间 ___ s | 输出5 ___ ___ ___ s | 输出6 ___ ___ ___ s | |
| | 通信功能选件 | □FGT故障脱扣信号 | □FNX储能信号 | □FHX合闸准备就绪信号 | □FQX欠电压输出信号 □FCT抽屉座通信模块组件（仅适用Modbus协议） |
| | □FDY专用电源模块 | □DC24V | | | |
| | □FDY/WT直流电源模块 | □DC110V | □DC220V | | |
| | □FZZ两路电源自动电源转换系统 | 电子型自动转换控制器 □R型 □S型 □F型<br>智能型自动转换控制器 □ZR型 □ZS型 □ZF型<br>智能可通信自动转换控制器 □ZTR型□ZTS型□ZTF型 | | | |
| | □FLZ两进线一母联自动电源转换系统 | 智能型自动转换控制器 □WTT3型<br>智能型带并联转换自动转换控制器 □WTB3型 | □通信 | | |
| | □FLZ三电源自动电源转换系统 | 智能型自动转换控制器 □WTT5型 | □通信 | | |

注1：所有电源模块电压均为输入电压，输出均为DC24V，用户应根据自己提供的电源电压选择相应的电源模块。若断路器选择了电源模块，则智能控制器的电源电压不作选择。注2：剩余电流保护功能选择“跳闸并报警”时剩余电流故障报警信号通过“2路可编程输出模块”输出，其他选择功能报警信号需通过“6路可编程扩展模块”输出。注3：可提供低温至-40℃断路器。注4：选择FLZ自动电源转换系统时断路器标配FAN按钮锁定装置。注5、选择FZZ、FLZ自动电源转换系统时，智能控制器、分励脱扣器、合闸电磁铁、电动操作机构电压均为AC230V。

# ORDERING FORM OF BREAKER

**Order form of breaker (with type EA35 or EA36 intelligent controller)** (Please fill numbers in ____ or mark √ in □)

| | | | | | |
|---|---|---|---|---|---|
| Name | | Order amount | | Order date | |
| Type | CW3V-_____ | | | □On land | □humid(TH type) |
| Rated voltage | In =_____ A | Rated current | □AC400V | □AC690V | □AC1140V |
| Mounting | □Fixed | □Draw-out | | | |
| Connection | □Horizontal | □ Vertical | □The upper vertical and the below horizontal | | □The below vertical and the upper horizontal |

**Intelligent controller**

Type selection □EA35 □EA36

**Basic function**

- Long-time delay Ir1_____ A t1_____ s Short-time delay Ir2_____A t2_____ s Instantaneous Ir3_____A
- Earth-fault protection Ir4_____A t4_____ s (Only for type 36)
- Curve of long-time delay □General inverse long-time delay ($I^2t$) □Special inverse time delay (It) □High-voltage fuse type ($I^4t$)
- Neutral protection □OFF □50%In □100%In □200%In (Protection of N pole of double leg of a circuit cross-section for three-pole circuit breaker)

**Selective function**

- Overload pre-alarm Ir0=_____Ir1
- □Current unbalance operating threshold___% operating delay__s Return threshold___% Return delay ___s □OFF □Alarm □Trip
- □Open-phase function operating threshold__% operating delay__s Return threshold___% Return delay ___s □OFF □Alarm □Trip
- □Communication | □Communtcative protocol | Standardard □Modbus / Specical □Profibus □Devicenet □CAN
- □ZSI function

Users must choose 2 lines programmable output module (internal connected) or 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they choose alarm function.

Voltage of intelligent controller □AC230V □AC400 | □DC220V □DC110V(Equipped with DC power supply module) | □DC24V (selective power supply module)

**Accessories**

| | | | | |
|---|---|---|---|---|
| Shunt release | □AC230V | □AC400V | □DC220V | □DC110V |
| Closing electromagnet | □AC230V | □AC400V | □DC220V | □DC110V |
| Power-driven operation mechanism | □AC230V | □AC400V | □DC220V | □DC110V |

Auxiliary switch □Four pairs of changeover contacts □Four pieces of normally-open contacts (NC) and four pieces of normally-closed contacts | Exceptional pattern □Six pairs of changeover contacts □Six pieces of normally-open contacts (NC) and six pieces of normally-closed contacts

Overvoltage suppressor □Feed-in from top □Feed-in from bottom | Exceptional pattern □Feed-in from top and bottom

**Choice of accessories**

- □Under-voltage release □AC230V □AC400V / □Instantaneous | Time delay □0.5s □1s □2s □3s
- □ "Opening" lock mechanism □One lock and one key □Two locks and one key □Three locks and two keys
- □Mechanical interlock Two sets of circuit breakers □Steel lock interlock □Link rod interlock (horizontally interlock) / Three sets of circuit breakers □Pattern three of steel lock interlock □Pattern one of link rod interlock □Pattern two of link rod interlock □Pattern three of link rod interlock
- □Pushbutton lock mechanism □Interphase barriers □Counter
- □Electrical module for indication of ready-for-close □Remote reset □Electrical indication mechanism of socket's position □Electrical indication mechanism of storage signal Accessories monitoring units
- □Accessories monitoring units □Unit with transformer's center earth externally connected
- □Current transformer with the neutral line N connected externally □FDH-80 □FDH-120 □FDH-260
- □2 lines programmable output module Output1number ____ type_____ time _____ s Output2 ____ ____ ____ s
- □6 lines programmable output expansion module Output1 number ____ type____ time ____ s Output2____ ____ ____ s Output3____ ____ ____ s / Output4 number ____ type____ time ____ s Output5____ ____ ____ s Output6____ ____ ____ s
- Communication choices of accessories □Signal of fault release □Signal of charging □Signal of ready-for-close □Signal of under-voltage □Components of draw-out socket communication module □Normal power supply module
- □DC power supply module □DC24V
- □Automatic power supply switch system □DC110V □DC220V
- □Automatic switch controller | Automatic switch controller □R type □S type □F type

Note:

Note: Users can choose transformer's center earth type or vectorial summation type for earth-fault protection. If they make no choices the default type is the vectorial summation type. Users should order units with transformer's center earth externally connected (earth transformer and earth module included) if they choose the transformer's center earth type.

# ORDERING FORM OF BREAKER

**Order form of breaker(with type EP35、EP36 or EQ35、EQ36 intelligent controller)** (Please fill numbers in ____ or mark √ in □)

| | | | | | |
|---|---|---|---|---|---|
| Name | | Order amount | | Order date | |

Type CW3V-_____ □On land □humid(TH type)

Rated voltage In =_____A Rated current □AC400V □AC690V

Mounting □Fixed □Draw-out

Connection □Horizontal □Vertical □he upper vertical and the below horizontal □The below vertical and the upper horizontal

**Type selection**

Type selection □EP35 □EP36 □EQ35 □EQ36

**Intelligent**

Long-time delay Ir1_____A t1_____s Short-time delay Ir2_____A t2_____s Instantaneous Ir3_____A

Earth-fault protection $I_{r4}$_____A $t_4$ _____s (Only for type 36)

Curve of long-time delay □General inverse long-time delay($I^2t$) □ Special inverse time delay(It) □High-voltage fuse type($I^4t$)

Neutral protection □OFF □50%In □100%In □200%In (Protection of N pole of double leg of a circuit cross-section for three-pole circuit breaker)

**Controller**

□Overload pre-alarm $I_{r0}$= _____$I_{r1}$

□Current unbalance Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip

□Open-phase function Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip

□demand current protection Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip

□Under-voltage protection Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip

□Over-voltage protection Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip

□Current unbalance Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip

□Phase sequence protection Operating threshold__% Operating delay 0.3s

□Communication | □Communtcative protocol | Standardard □Modbus | Specical □Profibus □Devicenet □CAN

□ ZSI function

Users must choose 2 lines programmable output module (internal connected) or 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they choose alarm function.

Voltage of intelligent controller □AC230V □AC400V | □DC220V □DC110V(Equipped with DC power supply module) | □DC24V (selective power supply module)

**Accessories**

Shunt release □AC230V □AC400V □DC220V □DC110V

Closing electromagnet □AC230V □AC400V □DC220V □DC110V

Power-driven operation mechanism □AC230V □AC400V □DC220V □DC110V

Auxiliary switch □Four pairs of changeover contacts □Four pieces of normally-open contacts (NC) and four pieces of normally-closed contacts | Exceptional pattern □Six pairs of changeover contacts □Six pieces of normally-open contacts (NC) and six pieces of normally-closed contacts

Overvoltage suppressor □Feed-in from top □Feed-in from bottom | Exceptional pattern □Feed-in from top and bottom

**Choice of accessories**

□AC230V □AC400V

□Under-voltage release □ Instantaneous | Time delay □0.5s □1s □2s □3s

□ "opening" lock mechanism □ One lock and one key □Two locks and one key □Three locks and two keys

□Mechanical interlock Two sets of circuit breakers □Steel lock interlock □Link rod interlock (horizontally interlock)

Three sets of circuit breakers □Pattern three of steel lock interlock □Pattern one of link rod interlock □Pattern two of link rod interlock □Pattern three of link rod interlock

□Pushbutton lock mechanism □Interphase barriers □Counter

□Electrical module for indication of ready-for-close □Remote reset □Electrical indication mechanism of socket's position □Electrical indication mechanism of storage signal

□Accessories monitoring units □Unit with transformer's center erath externally connected

□ Current transformer with the neutral line N connected extern □FDH-80 □FDH-120 □FDH-260

□2 lines programmable output module Output1 ____ type_____ time_____s Output2____ ____ ____ s

□6 lines programmable output expansion module Output1 number —— type—— time —— s Output2—— —— —— s Output3—— —— —— s

Output4 number —— type—— time —— s Output5—— —— —— s Output6—— —— —— s

Communication choices of accessories □Signal of fault release □ Signal of charging □ Signal of ready-for-close □Signal of under-voltage □Components of draw-out socket communication module

□Normal power supply module □DC24V

□DC power supply module □DC110V □DC220V

□Automatic power supply switch system | Automatic switch controller □R type □S type □F type

Note:

Note: Users can choose transformer's center erath type or vectorial summation type for erath-fault protection. If they make no choices the default type is the vectorial summation type. Users should order units with transformer's center erath externally connected (earth transformer and earth module included) If they choose the transformer's center earth type.

# ORDERING FORM OF BREAKER

**Order form of breaker (with type EG35 or EG36 intelligent controller)** (Please fill numbers in ____ or mark √ in □)

| | | | | | |
|---|---|---|---|---|---|
| Name | | Order amount | | Order date | |
| Type | CW3V– _____ | | | □On land | □humid(TH type) |
| Rated voltage | In = _____A | Rated current | □AC400V | □AC690V | |
| Mounting | □Fixed | □Draw–out | | | |
| Connection | □Horizontal | □ Vertical | □The upper vertical and the below horizontal | □The below vertical and the upper horizontal | |

**Intelligent controller**

Type selection □Generator protection type EG35 □Generator protection type EG36

**Basic function**

- Long–time delay Ir1_____ A t1_____ s Short–time delay Ir2_____A t2_____ s Instantaneous Ir3_____A
- Earth–fault protection $I_{r4}$ _____ A $t_4$ _____ s(Only for type 36)
- Under–frequency protection Operating threshold___ Operating delay___ s Return threshold___ Return delay___ s □OFF □Alarm □Trip
- Over–frequency protection Operating threshold___ Operating delay___ s Return threshold___ Return delay___ s □OFF □Alarm □Trip
- Inverse power protection Operating threshold___ Operating delay___ s Return threshold___ Return delay___ s □OFF □Alarm □Trip
- Neutral protection □OFF □50%In □100%In

**Selective function**

- □Overload pre–alarm $I_{r0}$= $I_{r1}$
- □Current unbalance Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □Open–phase function Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □demand current protection Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □Under–voltage protection Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □Over–voltage protection Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □Current unbalance Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □Phase sequence protection Operating threshold__% Operating delay 0.3s
- □Communication □Communtcative protocol Standardard □Modbus; Specical □Profibus □Devicenet □CAN
- □ ZSI function

Users must choose 2 lines programmable output module (internal connected) or 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they choose alarm function.

Voltage of intelligent controller □AC230V □AC400V □DC220V □DC110V(Equipped with DC power supply module) □DC24V ( selective power supply module )

**Accessories**

| | | | | |
|---|---|---|---|---|
| Shunt release | □AC230V | □AC400V | □DC220V | □DC110V |
| Closing electromagnet | □AC230V | □AC400V | □DC220V | □DC110V |
| Power–driven operation mechanism | □AC230V | □AC400V | □DC220V | □DC110V |

| | |
|---|---|
| Auxiliary switch □Four pairs of changeover contacts □Four pieces of normally–open contacts (NC) and four pieces of normally–closed contacts | Exceptional pattern □Six pairs of changeover contacts □Six pieces of normally–open contacts (NC) and six pieces of normally–closed contacts |
| Overvoltage suppressor □Feed–in from top □Feed–in from bottom | Exceptional pattern □Feed–in from top and bottom |

**Choice of accessories**

- □Under–voltage release □AC230V □AC400V; □ Instantaneous Time delay □0.5s □1s □2s □3s
- □ "opening" lock mechanism □ One lock and one key □Two locks and one key □Three locks and two keys
- □Mechanical interlock: Two sets of circuit breakers □Steel lock interlock □Link rod interlock (horizontally interlock); Three sets of circuit breakers □Pattern three of steel lock interlock □Pattern one of link rod interlock □Pattern two of link rod interlock □Pattern three of link rod interlock
- □pushbutton lock mechanism □interphase barriers □Counter
- □Electrical module for indication of ready–for–close □Remote reset □Electrical indication mechanism of socket's position □Electrical indication mechanism of storage signal
- □Accessories monitoring units □Unit with transformer's center earth externally connected
- □ Current transformer with the neutral line N connected extern □FDH–80 □FDH–120 □FDH–260
- □2 lines programmable output module Output1 ____ type_____ time_____s Output2_____ s
- □6 lines programmable output expansion module: Output1 number ____ type____ time ____ s Output2____ ____ ____ s Output3____ ____ ____ s; Output4 number ____ type____ time ____ s Output5____ ____ ____ s Output6____ ____ ____ s
- Communication choices of accessories □Signal of fault release □Signal of charging □Signal of ready–for–close □Signal of under–voltage □Components of draw–out socket communication module □Normal power supply module
- □Normal power supply module □DC24V
- □DC power supply module □DC110V □DC220V
- □Automatic power supply switch system Automatic switch controller □R type □S type □F type

Note:

# ORDERING FORM OF BREAKER

**Order form of breaker (with type EN35 or EN36 intelligent controller)** (Please fill numbers in ____ or mark √ in □)

| | | | | | |
|---|---|---|---|---|---|
| Name | | Order amount | | Order date | |

Type CW3V-_____ □On land □humid(TH type)

Rated voltage In =_____ A | Rated current □AC400V □AC690V □AC1140V

Mounting □Fixed □Draw-out

Connection □Horizontal □Vertical □The upper vertical and the below horizontal □The below vertical and the upper horizontal

**Intelligent controller**

Type selection □EN35 □EN36

**Basic function**

Long-time delay Ir1_____ A t1_____ s Short-time delay Ir2_____ A t2_____ s Instantaneous Ir3_____A

Earth-fault protection Ir4_____A t4_____ s (Only for type 36)

Curve of long-time delay □General inverse long-time delay ($I^2t$)

Neutral protection □OFF □50%In □100%In □200%In (Protection of N pole of double leg of a circuit cross-section for three-pole circuit breaker)

**Selective function**

Overload pre-alarm Ir0=_____Ir1

□Current unbalance operating threshold___% operating delay__s Return threshold___% Return delay ___s □OFF □Alarm □Trip

□Open-phase function operating threshold__% operating delay__s Return threshold___% Return delay ___s □OFF □Alarm □Trip

□Power, energy measure

□Communication | □Communtcative protocol | Standardard □Modbus | Specical □Profibus □Devicenet □CAN

□ZSI function

Users must choose 2 lines programmable output module (internal connected) or 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they choose alarm function.

Voltage of intelligent controller □AC230V □AC400 | □DC220V | □DC110V(Equipped with DC power supply module) | □DC24V (selective power supply module)

**Accessories**

Shunt release □AC230V □AC400V □DC220V □DC110V

Closing electromagnet □AC230V □AC400V □DC220V □DC110V

Power-driven operation mechanism □AC230V □AC400V □DC220V □DC110V

Auxiliary switch □Four pairs of changeover contacts □Four pieces of normally-open contacts (NC) and four pieces of normally-closed contacts | Exceptional pattern □Six pairs of changeover contacts □Six pieces of normally-open contacts (NC) and six pieces of normally-closed contacts

Overvoltage suppressor □Feed-in from top □Feed-in from bottom | Exceptional pattern □Feed-in from top and bottom

**Choice of accessories**

□Under-voltage release □AC230V □AC400V □Instantaneous | Time delay □0.5s □1s □2s □3s

□ "Opening" lock mechanism □One lock and one key □Two locks and one key □Three locks and two keys

□Mechanical interlock Two sets of circuit breakers □Steel lock interlock □Link rod interlock (horizontally interlock)
Three sets of circuit breakers □Pattern three of steel lock interlock □Pattern one of link rod interlock □Pattern two of link rod interlock □Pattern three of link rod interlock

□Pushbutton lock mechanism □Interphase barriers □Counter

□Electrical module for indication of ready-for-close □Remote reset □Electrical indication mechanism of socket's position
□Electrical indication mechanism of storage signal Accessories monitoring units

□Accessories monitoring units □Unit with transformer's center earth externally connected

□Current transformer with the neutral line N connected externally □FDH-80 □FDH-120 □FDH-260

□2 lines programmable output module Output1number ____ type_____ time _____ s Output2 ____ ____ ____ s

□6 lines programmable output expansion module Output1 number ____ type____ time ____ s Output2____ ____ ____ s Output3____ ____ ____ s
Output4 number ____ type____ time ____ s Output5____ ____ ____ s Output6____ ____ ____ s

Communication choices of accessories□Signal of fault release □Signal of charging □Signal of ready-for-close
□Signal of under-voltage □Components of draw-out socket communication module □Normal power supply module

□DC power supply module □DC24V

□Automatic power supply switch system □DC110V □DC220V

□Automatic switch controller | Automatic switch controller □R type □S type □F type

Note:

Note: Users can choose transformer's center earth type or vectorial summation type for earth-fault protection. If they make no choices the default type is the vectorial summation type. Users should order units with transformer's center earth externally connected (earth transformer and earth module included) if they choose the transformer's center earth type.

# ORDERING FORM OF BREAKER

**Order form of breaker (with type EA37 intelligent controller)** (Please fill numbers in ____or mark √ in □)

| | | | | | |
|---|---|---|---|---|---|
| Name | | Order amount | | Order date | |

Type □ CW3V– 2000 □On land □humid(TH type)

Rated voltage In =_____ A | Rated current □AC400V □AC690V □AC1140V

Mounting □Fixed □Draw–out

Connection □Horizontal □ Vertical □The upper vertical and the below horizontal □The below vertical and the upper horizontal(only draw–out)

**Intelligent controller**

Type selection □EA37

**Basic function**

Long–time delay Ir1_____ A t1_____ s Short–time delay Ir2_____A t2_____ s Instantaneous Ir3_____A

Residual current protection I△n_____A △t _____s □alarm and non–trip □trip □alarm and trip

Curve of long–time delay □General inverse long–time delay ($I^2t$) □Special inverse time delay (It) □High–voltage fuse type ($I^4t$)

Neutral protection □OFF □50%In □100%In □200%In ( Protection of N pole of double leg of a circuit cross–section for three–pole circuit breaker )

**Selective function**

Overload pre–alarm Ir0=_____Ir1

□Current unbalance operating threshold___% operating delay__s Return threshold___% Return delay ___s □OFF □Alarm □Trip

□Open–phase function operating threshold__% operating delay__s Return threshold___% Return delay ___s □OFF □Alarm □Trip

□Communication | □Communtcative protocol | Standardard □Modbus

Specical □Profibus □Devicenet □CAN

□ZSI function

Users must choose 2 lines programmable output module (internal connected) or 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they choose alarm function.

Voltage of intelligent controller □AC230V □AC400V | □DC220V □DC110V( Equipped with DC power supply module ) | □DC24V ( selective specical supply moduce )

**Accessories**

Shunt release □AC230V □AC400V □DC220V □DC110V

Closing electromagnet □AC230V □AC400V □DC220V □DC110V

Power–driven operation mechanism □AC230V □AC400V □DC220V □DC110V

Auxiliary switch □Four pairs of changeover contacts □Four pieces of normally–open contacts (NC) and four pieces of normally–closed contacts | Exceptional pattern □Six pairs of changeover contacts □Six pieces of normally–open contacts (NC) and six pieces of normally–closed contacts

**Choice of accessories**

□Under–voltage release □AC230V □AC400V

□Instantaneous | Time delay □0.5s □1s □2s □3s

□ "Opening" lock mechanism □One lock and one key □Two locks and one key □Three locks and two keys

□Mechanical interlock Two sets of circuit breakers □Steel lock interlock □Link rod interlock (horizontally interlock)

Three sets of circuit breakers □Pattern three of steel lock interlock □Pattern one of link rod interlock □Pattern two of link rod interlock □Pattern three of link rod interlock

□Pushbutton lock mechanism □Interphase barriers □Counter

□Electrical module for indication of ready–for–close □Remote reset □Electrical indication mechanism of socket's position

□Electrical indication mechanism of storage signal Accessories monitoring units

□Accessories monitoring units □residual current transformer ( must be selected )

□Current tramsformer with the neutral line N connected externally □FDH–80 □FDH–120 □FDH–260

□2 lines programmable output module Output1number G type b Output2 G b

□6 lines programmable output expansion module Output1 number ____ type____ time ____ s Output2____ ____ ____ s Output3____ ____ ____ s

Output4 number ____ type____ time ____ s Output5____ ____ ____ s Output6____ ____ ____ s

Communication choices of accessories □Signal of fault release □Signal of charging □Signal of ready–for–close □Signal of under–voltage

□Components of draw–out socket communication module □Normal power supply module

□DC power supply module □DC24V

□Automatic power supply switch system □DC110V □DC220V

□Automatic switch controller | Automatic switch controller □R type □S type □F type

Note:

Note1:selecting"alarm and non–trip"or"alarm and trip"for residual current protection if "alarm" is selected for other selecting function,users only select "6lines programmable output expansion module",beause residual current fault alarm signal output is by "2lines programmable output expansion module".

# ORDERING FORM OF BREAKER

**Order form of breaker (with type EP37 or EQ37 intelligent controller)** (Please fill numbers in ____ or mark √ in □)

| | | | | | |
|---|---|---|---|---|---|
| Name | | Order amount | | Order date | |
| Type | □ CW3V– 2000 | | | □On land | □humid(TH type) |
| Rated voltage | In = _____A | Rated current | □AC400V | □AC690V | |
| Mounting | □Fixed | □Draw–out | | | |
| Connection | □Horizontal | □Vertical | □he upper vertical and the below horizontal | □The below vertical and the upper horizontal(only draw–out) | |

**Type selection**

Type selection □EP37 □EQ37

**Intelligent**

- Long–time delay Ir1_____A t1_____s Short–time delay Ir2_____A t2_____s Instantaneous Ir3_____A
- Residual current protection I△n_____A △t _____s □alarm and non–trip □trip □alarm and trip
- Curve of long–time delay □General inverse long–time delay($I^2t$) □ Special inverse time delay(It) □High–voltage fuse type($I^4t$)
- Neutral protection □OFF □50%In □100%In □200%In (Protection of N pole of double leg of a circuit cross–section for three–pole circuit breaker )

**Controller**

- □Overload pre–alarm Ir0= _____Ir1
- □Current unbalance Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □Open–phase function Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □demand current protection Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □Under–voltage protection Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □Over–voltage protection Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □Current unbalance Operating threshold__% Operating delay__s Return threshold__% Return delay__s □OFF □Alarm □Trip
- □Phase sequence protection Operating threshold__% Operating delay 0.3s
- □Communication | □Communtcative protocol | Standardard □Modbus; Specical □Profibus □Devicenet □CAN
- □ ZSI function

Users must choose 2 lines programmable output module (internal connected) or 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they choose alarm function.

Voltage of intelligent controller □AC230V □AC400V | □DC220V | □DC110V(Equipped with DC power supply module) | □DC24V ( selective specical supply moduce )

**Accessories**

| | | | | |
|---|---|---|---|---|
| Shunt release | □AC230V | □AC400V | □DC220V | □DC110V |
| Closing electromagnet | □AC230V | □AC400V | □DC220V | □DC110V |
| Power–driven operation mechanism | □AC230V | □AC400V | □DC220V | □DC110V |

Auxiliary switch □Four pairs of changeover contacts □Four pieces of normally–open contacts (NC) and four pieces of normally–closed contacts | Exceptional pattern □Six pairs of changeover contacts □Six pieces of normally–open contacts (NC) and six pieces of normally–closed contacts

**Choice of accessories**

□AC230V □AC400V

□Under–voltage release □ Instantaneous | Time delay □0.5s □1s □2s □3s

□ "opening" lock mechanism □ One lock and one key □Two locks and one key □Three locks and two keys

□Mechanical interlock — Two sets of circuit breakers □Steel lock interlock □Link rod interlock (horizontally interlock); Three sets of circuit breakers □Pattern three of steel lock interlock □Pattern one of link rod interlock □Pattern two of link rod interlock □Pattern three of link rod interlock

□Pushbutton lock mechanism □Interphase barriers(must be selected for CW3–1600 vertical connection) □Counter

□Electrical module for indication of ready–for–close □Remote reset □Electrical indication mechanism of socket's position □Electrical indication mechanism of storage signal

□Accessories monitoring units □residual current transformer ( must be selected )

□ Current transformer with the neutral line N connected extern □FDH–80 □FDH–120 □FDH–260

□2 lines programmable output module Output1 G type b Output2 G b

□6 lines programmable output expansion module Output1 number —— type —— time —— s Output2 —— —— —— s Output3 —— —— —— s; Output4 number —— type —— time —— s Output5 —— —— —— s Output6 —— —— —— s

Communication choices of accessories □Signal of fault release □ Signal of charging □ Signal of ready–for–close □Signal of under–voltage □Components of draw–out socket communication module

□Normal power supply module □DC24V

□DC power supply module □DC110V □DC220V

□Automatic power supply switch system | Automatic switch controller □R type □S type □F type

Note:

Note1:selecting"alarm and non–trip"or"alarm and trip"for residual current protection if "alarm" is selected for other selecting function,users only select "6lines programmable output expansion module",beause residual current fault alarm signal output is by "2lines programmable output expansion module"

# ORDERING FORM OF BREAKER

**Order form of breaker (with type EN37 intelligent controller)** (Please fill numbers in ____ or mark √ in □)

| | | | | | |
|---|---|---|---|---|---|
| Name | | Order amount | | Order date | |
| Type | □ CW3V– 2000 | | | □On land | □humid(TH type) |
| Rated voltage | In =_____ A | Rated current | □AC400V | □AC690V | □ AC1140V |
| Mounting | □Fixed | □Draw–out | | | |
| Connection | □Horizontal | □ Vertical | □The upper vertical and the below horizontal | □The below vertical and the upper horizontal(only draw–out) | |

**Intelligent controller**

Type selection □EN37

**Basic function**

- Long–time delay Ir1_____ A t1_____ s Short–time delay Ir2_____ A t2_____ s Instantaneous Ir3_____A
- Residual current protection I△n_____A △t _____s □alarm and non–trip □trip □alarm and trip
- Curve of long–time delay □General inverse long–time delay ($I^2t$) □Special inverse time delay (It) □High–voltage fuse type ($I^4t$)
- Neutral protection □OFF □50%In □100%In □200%In (Protection of N pole of double leg of a circuit cross–section for three–pole circuit breaker)

**Selective function**

- Overload pre–alarm Ir0=_____Ir1
- □Current unbalance operating threshold___% operating delay__s Return threshold___% Return delay ___s □OFF □Alarm □Trip
- □Open–phase function operating threshold__% operating delay__s Return threshold___% Return delay ___s □OFF □Alarm □Trip
- □Power, energy measure
- □Communication | □Communtcative protocol | Standardard □Modbus; Specical □Profibus □Devicenet □CAN
- □ZSI function

Users must choose 2 lines programmable output module (internal connected) or 6 lines programmable output expansion module (external connected) and choose signal outputs by "Output number definition of programmable output module" table when they choose alarm function.

Voltage of intelligent controller □AC230V □AC400V | □DC220V | □DC110V(Equipped with DC power supply module) | □DC24V (selective specical supply moduce)

**Accessories**

- Shunt release □AC230V □AC400V □DC220V □DC110V
- Closing electromagnet □AC230V □AC400V □DC220V □DC110V
- Power–driven operation mechanism □AC230V □AC400V □DC220V □DC110V
- Auxiliary switch □Four pairs of changeover contacts □Four pieces of normally–open contacts (NC) and four pieces of normally–closed contacts | Exceptional pattern □Six pairs of changeover contacts □Six pieces of normally–open contacts (NC) and six pieces of normally–closed contacts

**Choice of accessories**

- □Under–voltage release □AC230V □AC400V □Instantaneous Time delay □0.5s □1s □2s □3s
- □ "Opening" lock mechanism □One lock and one key □Two locks and one key □Three locks and two keys
- □Mechanical interlock Two sets of circuit breakers □Steel lock interlock □Link rod interlock (horizontally interlock) Three sets of circuit breakers □Pattern three of steel lock interlock □Pattern one of link rod interlock □Pattern two of link rod interlock □Pattern three of link rod interlock
- □Pushbutton lock mechanism □Interphase barriers □Counter
- □Electrical module for indication of ready–for–close □Remote reset □Electrical indication mechanism of socket's position □Electrical indication mechanism of storage signal Accessories monitoring units
- □Accessories monitoring units □residual current transformer (must be selected)
- □Current tramsformer with the neutral line N connected externally □FDH–80 □FDH–120 □FDH–260
- □2 lines programmable output module Output1number G type b Output2 G b
- □6 lines programmable output expansion module Output1 number ____ type____ time ____ s Output2____ ____ ____ s Output3____ ____ ____ s Output4 number ____ type____ time ____ s Output5____ ____ ____ s Output6____ ____ ____ s
- Communication choices of accessories □Signal of fault release □Signal of charging □Signal of ready–for–close □Signal of under–voltage □Components of draw–out socket communication module □Normal power supply module
- □DC power supply module □DC24V
- □Automatic power supply switch system □DC110V □DC220V
- □Automatic switch controller | Automatic switch controller □R type □S type □F type

Note:

Note1:selecting"alarm and non–trip"or"alarm and trip"for residual current protection if "alarm" is selected for other selecting function,users only select "6lines programmable output expansion module",beause residual current fault alarm signal output is by "2lines programmable output expansion module".

**2路可编程输出模块输出定义（置于断路器内部）**

可编程输出1和输出2可通过智能控制器按“可编程输出模块输出编号定义表”对以下各项内容编程设置输出，如用户对编程内容不作选择，本公司出厂缺省编号为：可编程输出1选择Bc1，即电流卸载1,时间延时触点，延时时间为1秒；可编程输出2选择Cc1，即电流卸载2,时间延时触点，延时时间为1秒。

对EN37、EA37、EP37、EQ37智能控制器，可编程输出1和输出2编程输出都为Gb，即剩余电流脱扣报警，闭锁触头。

**6路可编程扩展输出模块（外部附件）**

6路可编程扩展输出模块通过智能控制器按“可编程输出模块输出编号定义表”编程设置输出。编程输出只有在断路器具有相应功能的前提下才有效，用户应在订货规范中注明编号、类型、延时时间（仅对时间延时触点有效），出厂时按该编号供货，如未作选择本公司出厂缺省编号为：可编程输出1选择Aa，可编程输出2选择Bc1，可编程输出3选择Cc1，可编程输出4选择Da，可编程输出5选择Ea，可编程输出6选择Fa。

**Output definition of 2 lines programmable output module (placed in the circuit breaker)**

Programmable output 1 and 2 set outputs for the following items by "Output number definition of programmable output module" table by intelligent controller. If users make no choices about programming content the default number is as follows: choose Bc1 for programmable output 1 which represents current unloading 1, time delay contact and delay time is 1s and choose Cc1 for programmable output 2 which represents current unloading 2, time delay contact and delay time is 1s.

**6 lines programmable output expansion module (external connected)**

6 lines programmable output expansion module can program and set outputs by "Output number definition of programmable output module" table by intelligent controller. Programming output is effective only when circuit breaker has corresponding functions. Users must indicate number, type and delay time (just effective for time delay contact) and the manufacture provides goods in accordance with the number. If users make no choices the default number is as follows: choose Aa for programmable output 1, choose Bc1 for programmable output 2, choose Cc1 for programmable output 3, choose Da for programmable output 4, choose Ea for programmable output 5 and choose Fa for programmable output 6.

可编程输出模块输出编号定义表

Output number definition of programmable output module

| 编号 No. | 功　能 Function | | 备　注 Remarks | 控制器类型 Controller type |
|---|---|---|---|---|
| A | $I_{r0}$ | 过载预报警 Overload pre-alarm | 过载预报警及电流卸载 Overload pre-alarm and current shedding | 适用于EN、EA、EP、EQ、EG型 Type EN、EA, EP, EQ, EG |
| B | $I_{LC1}$ | 电流卸载1 Current shedding | | |
| C | $I_{LC2}$ | 电流卸载2 Current shedding | | |
| D | $I_{r1}$ | 长延时脱扣报警 Long-time delay trip alarm | 电流保护报警 Current protection alarm | |
| E | $I_{r2}$ | 短延时脱扣报警 Short-time delay trip alarm | | |
| F | $I_{r3}$ | 瞬时脱扣报警 Instantaneous trip alarm | | |
| G | $I_{r4}/I_{\triangle n}$ | 接地/剩余电流脱扣报警 Earth/residual current trip alarm | | |
| H | Iunbal | 电流不平衡动作报警 Current unbalance Operating alarm | | |
| I | 断相 Open-phase | 断相动作报警 Open-phase alarm | | |
| J | 超温 Over-temperature | 控制器超温报警 Over-temperature alarm | 内部故障报警 Internal fault alarm | 适用于EN、EA、EP、EQ、EG型 Type EN、EA, EP, EQ, EG |
| K | 存储器故障 Memory fault | 存储器故障报警 Memory fault alarm | | |
| L | 内部附件故障 Internal accessories fault | 内部附件故障报警 Internal accessories fault alarm | | |
| M | $\overline{I}_{1}max$ | 最大需用电流动作报警 Maximum demand current operating alarm | 电流保护报警 Current protection alarm | 适用于EP、EQ、EG型 Type EP, EQ, EG |
| N | $\overline{I}_{2}max$ | 最大需用电流动作报警 Maximum demand current operating alarm | | |
| O | $\overline{I}_{3}max$ | 最大需用电流动作报警 Maximum demand current operating alarm | | |
| P | $\overline{I}_{n}max$ | 最大需用电流动作报警 Maximum demand current operating alarm | | |
| Q | Umin | 低电压动作报警 Under-voltage operating alarm | 电压保护报警 Voltage protection alarm | |
| R | Umax | 过电压动作报警 Over-voltage operating alarm | | |
| S | Uunbal | 电压不平衡动作报警 Voltage unbalance operating alarm | | |
| T | 相序 Phase sequence | 相序保护动作报警 Phase sequence operating alarm | 其它保护报警 Other protections alarm | |
| U | $F_{MIN}$ | 欠频保护报警 Under-frequency operating alarm | | 适用于EG型 Type EG |
| V | $F_{MAX}$ | 过频保护报警 Over- frequency operating alarm | | |
| W | rPmax | 逆功率动作报警 Inverse frequency operating alarm | | |

## 可编程输出模块输出类型定义表
Output number definition of programmable output module

| 输出编号<br>Output number | 输出类型<br>Output type | 时间延时触头延时时间<br>delay time of time delay contact | 备注<br>Remarks |
|---|---|---|---|
| 见编号定义表<br>A ~ W<br>See the number definition table | a,非闭锁触头<br>non-interlocking contact<br>b,闭锁触头<br>Interlocking contact<br>c,时间延时触头<br>Time delay contact | 1 ~ 360s | 2路可编程输出模块（内置）或<br>6路可编程扩展输出模块（外置）<br>2 lines programmable output module (internal connected) or 6 lines programmable output expansion module (external connected) |

## 保护参数出厂缺省整定值
Factory's default setting values of protection parameters

如用户订货时已选择相应功能而未作具体要求，智能控制器出厂整定值按如下配置：
The manufacture would configure by "Factory's default setting values of protection parameters" table if users no specific requirements for functions when making order.

| 项目 Item | | 可调范围 Adjusted range | | | 出厂设定<br>Setting value | 备注<br>Remarks |
|---|---|---|---|---|---|---|
| 长延时保护<br>Long-time delay protection | 保护曲线类型<br>Curve types | $I^2t$ | It | $I^4t$ | $I^2t$ | EN、EG型仅有$I^2t$<br>Only $I^2t$ for type EN、EG |
| | 整定电流Ir1<br>Setting value of current | 0.4 ~ 1In | | | In | EN、EA、EP、EQ型<br>For type EN、EA, EP, EQ |
| | | 0.4 ~ 1.15In | | | | EG型<br>For type EG |
| | 整定时间t1<br>Setting value of time | 15 ~ 480s | 10 ~ 120s | 60 ~ 1440s | 480s | EN、EA、EP、EQ型<br>For type EN、EA, EP, EQ |
| | | 15 ~ 60s | | | 60s | EG型<br>for type EG |
| 短延时保护<br>Short-time delay protection | 整定电流Ir2<br>Setting value of current | CW3V-2000：(0.4 ~ 15)In+OFF<br>CW3V-3200：（0.4~10）In+OFF | | | 6Ir1 | EN、EA、EP、EQ型<br>For type EN、EA, EP, EQ |
| | | (0.4 ~ 5)In+OFF | | | 3Ir1 | EG型<br>For type EG |
| | 整定时间t2<br>Setting value of time | 0.1 ~ 0.4s（定时限或反时限+定时限）<br>definite time or definite and inverse time | | | 0.2s/反时限+定时限<br>definite and inverse time | EG型为定时限<br>inverse time |
| 瞬时保护<br>Instantaneous protection | 整定电流Ir3<br>Setting value of current | CW3V-2000 | (2 ~ 40) kA+OFF | | In≤1000A：15In<br>In = 1250A、1600：12In<br>In≥2000A：10In | |
| | | CW3V-3200 | (4 ~ 50) kA+OFF | | | |
| 接地保护<br>Earth-fault protection | 整定电流Ir4<br>Setting value of current | <1250A | (0.4 ~ 0.8)In | | 最大<br>Maximum | |
| | | ≥1250A | 500 ~ 1200A | | | |
| | 整定时间t4<br>Setting value of time | 0.1 ~ 0.4s+OFF | | | 0.4s/定时限<br>inverse time | |
| 剩余电流保护<br>Residual current | 额定剩余动作电流<br>Rated residual operating current | （0.5~30A） | | | 30A | EN37、EA37、EP37、EQ37型<br>Type EN37、EA37、EP37、EQ37、 |
| | 延时时间<br>Delay time | （0.10~5.00）s | | | 1.0s | |
| 中性极保护<br>Neutral protection | 电流整定值<br>Current setting value | OFF – N/2 – N–N × 2 | | | OFF | 三极断路器<br>Three-pole circuit breaker<br>EG型无N × 2 |

续 表
Continued table

| 项 目 Item | | 可调范围 Adjusted range | 出厂设定 Setting value | 备注 Remarks |
|---|---|---|---|---|
| 过载预报警 Overload pre-alarm | 整定电流Ir0 Setting value of current | (0.75 ~ 1.05)Ir1 | 1.05Ir1 | |
| 电流不平衡保护 Current unbalance protection | 动作阈值 Operating threshold | 20 ~ 80% | 60% | |
| | 动作延时 Operating delay | 1 ~ 40s | 40s | |
| | 返回阈值 Return threshold | 20% ~ 动作阈值 20% ~ Operating threshold | 20% | |
| | 返回延时 Return delay | 10 ~ 360s | 10s | |
| 断相保护 Open-phase protection | 动作阈值 Operating threshold | 90 ~ 99% | 95% | |
| | 动作延时 Operating delay | 0.1 ~ 3s | 3s | |
| | 返回阈值 Return threshold | 20% ~ 动作阈值 20% ~ Operating threshold | 20% | |
| | 返回延时 Return delay | 10 ~ 360s | 10s | |
| 需用电流保护 Demand current protection | 动作阈值 Operating threshold | 0.4 ~ 1In | 1In | |
| | 动作延时 Operating delay | 15 ~ 1500s | 1500s | |
| | 返回阈值 Return threshold | 0.4In ~ 动作阈值 0.4In ~ Operating threshold | 0.4In | |
| | 返回延时 Return delay | 15 ~ 3000s | 15s | |
| 低电压保护 Under-voltage protection | 动作阈值 Operating threshold | 50 ~ 1140V | 265V | |
| | 动作延时 Operating delay | 1 ~ 30s | 5s | |
| | 返回阈值 Return threshold | 动作阈值 ~ 969V Operating threshold ~ 969V | 325V | |
| | 返回延时 Return delay | 1 ~ 100s | 10s | |
| 过电压保护 Over-voltage protection | 动作阈值 Operating threshold | 200 ~ 1539V | 725V | |
| | 动作延时 Operating delay | 1 ~ 5s | 5s | |
| | 返回阈值 Return threshold | 200V ~ 动作阈值 200V ~ Operating threshold | 400V | |
| | 返回延时 Return delay | 1 ~ 36s | 2s | |
| 电压不平衡保护 Voltage unbalance protection | 动作阈值 Operating threshold | 2 ~ 50% | 30% | |
| | 动作延时 Operating delay | 1 ~ 40s | 40s | |
| | 返回阈值 Return threshold | 2% ~ 动作阈值 2% ~ Operating threshold | 10% | |
| | 返回延时 Return delay | 10 ~ 360s | 10s | |

续 表
Continued table

| 项 目 Item | | 可调范围 Adjusted range | 出厂设定 Setting value | 备注 Remarks |
|---|---|---|---|---|
| 逆功率保护 Inverse power protection | 动作阈值 Operating threshold | 20～500kW | 500kW | |
| | 动作延时 Operating delay | 0.2～20s | 20s | |
| | 返回阈值 Return threshold | 20kW～动作阈值 20kW～Operating threshold | 100kW | |
| | 返回延时 Return delay | 1～360s | 1s | |
| 过频保护 Over-frequency protection | 动作阈值 Operating threshold | 50～65Hz | 65Hz | |
| | 动作延时 Operating delay | 0.2～5s | 5s | |
| | 返回阈值 Return threshold | 45Hz～动作阈值 45Hz～Operating threshold | 50Hz | |
| | 返回延时 Return delay | 1～360s | 1s | |
| 欠频保护 Under-frequency protection | 动作阈值 Operating threshold | 45～60Hz | 45Hz | |
| | 动作延时 Operating delay | 0.2～5s | 5s | |
| | 返回阈值 Return threshold | 动作阈值～60Hz Action threshold～60Hz | 50Hz | |
| | 返回延时 Return delay | 1～360s | 1s | |
| 相序保护 Phase sequence protection | 动作阈值 Operating threshold | 1，2，3或1，3，2 | 1，2，3 | |
| | 动作延时 Operating delay | 0.3s | 0.3s | |
| 电流卸载 Current shedding | 动作阈值 Operating threshold | 0.2～1Ir1 | 1Ir1 | |
| | 动作延时 Operating delay | 20%～80%t1 | 80%t1 | |
| | 返回阈值 Return threshold | 0.2Ir1～动作阈值 0.2In～Operating threshold | 0.5Ir1 | |
| | 返回延时 Return delay | 10～600s | 10s | |

如用户订货时已选择6路可编程扩展输出模块而未作具体要求，则2路可编程输出模块和6路可编程扩展输出模块编程输出出厂整定值按如下配置：

If users have chosen 6 lines programmable output expansion module but have no specific requirements when making order, programmable outputs of 2 lines programmable output module and 6 lines programmable output expansion module are set as follows.

| | | 出厂设定<br>Setting value | 备　注　Remarks |
|---|---|---|---|
| 输出编号<br>Output number | A ~ W | Bc1,Cc1 | 2路可编程输出模块（内置）<br>2 lines programmable output module (internal connected) |
| | | Aa ,Bc1,Cc1 ,Da, Ea, Fa | 6路可编程扩展输出模块（外置）<br>6 lines programmable output expansion module (external connected) |
| 输出类型<br>Output type | a. 非闭锁触头<br>Non-interlocking contact<br>b. 闭锁触头<br>Interlocking contact<br>c. 时间延时触头<br>Time delay contact | c | |
| 时间延时触头<br>延时时间<br>delay time of time delay contact | 1 ~ 360s | 1s | |

本公司可提供不带智能控制器的断路器，符合GB/T14048.2附录L的CBI-Y要求，断路器无过电流保护功能，其主要技术指标、二次回路接线图、订货规范分别如下。

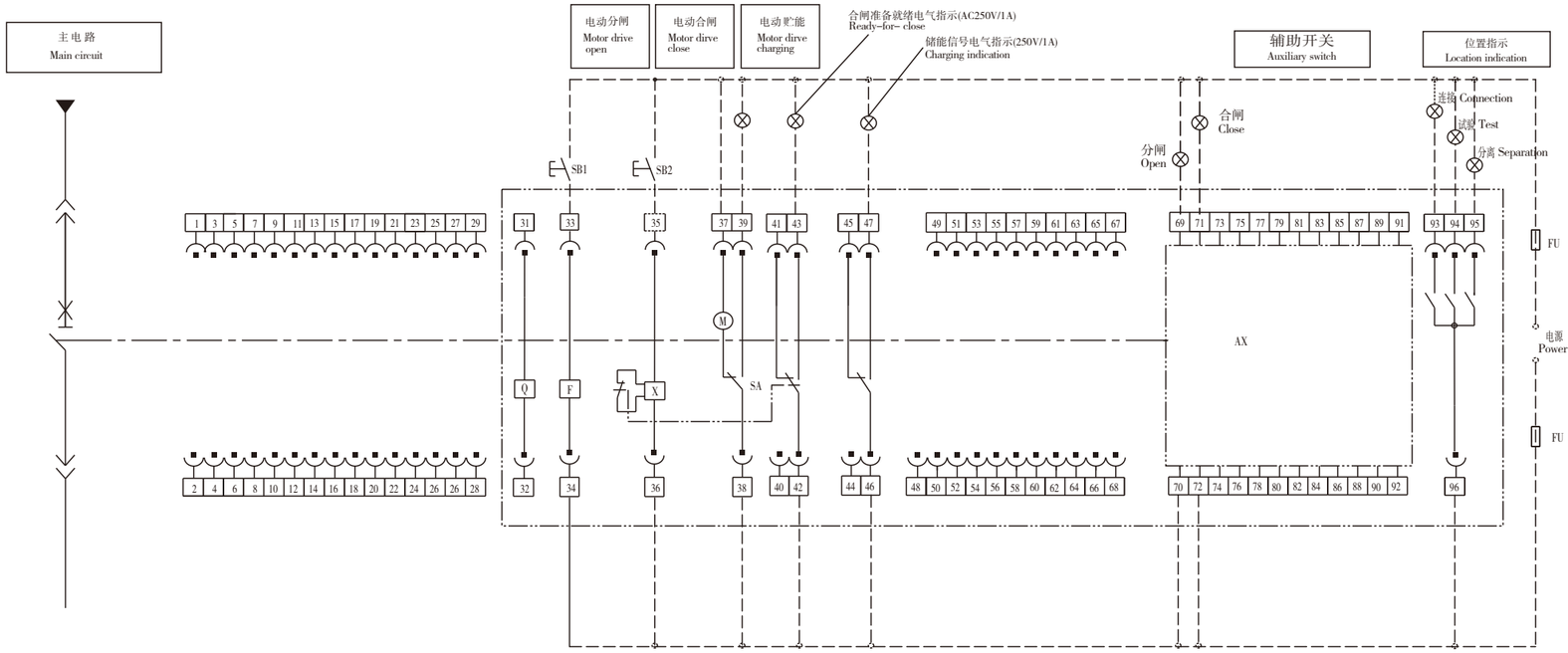
Can provide breakers without intelligent controllers, compliance with GB/T14048.2 annex L CBI-Y demands. The breakers are not fulfilling the requirements for overcurrent protection. Main technical index, wiring diagram of secondary circuit and order form, please seeing follow.

## ●主要技术指标
Main technical index

| 型号 Type | | CW3V-2000 | CW3V-3200 |
|---|---|---|---|
| 壳架等级额定电流Inm(A) Frame size rated current | | 2000 | 3200 |
| 额定电流In(A) Rated current | | 400,630,800, 1000,1250,1600,2000 | 630,800,1000,1250, 1600,2000,2500, 2900,3200 |
| 额定电压Ue(V) Rated voltage | | AC50Hz/60Hz，400、690、1140 | |
| 额定绝缘电压Ui(V) Rated insulation voltage | | 1250 | |
| 额定冲击耐受电压Uimp(kV) Rated impulse withstand voltage | | 12 | |
| 工频耐受电压U(V) Power frequency withstand voltage | | 3500 | |
| 极数 Pole number | | 3 | |
| 额定限制短路电流Icc(kA)(有效值) Rated conditional short circuit current（effective value） | AC400V | 50 | 65 |
| | AC690V | 50 | 65 |
| | AC1140V | 40 | 50 |

# CW3V-2000/3200无过电流保护断路器二次回路接线图

## Wiring diagram of secondary circuit of CW3V-2000/3200 not fulfilling the requirements for overcurrent protection

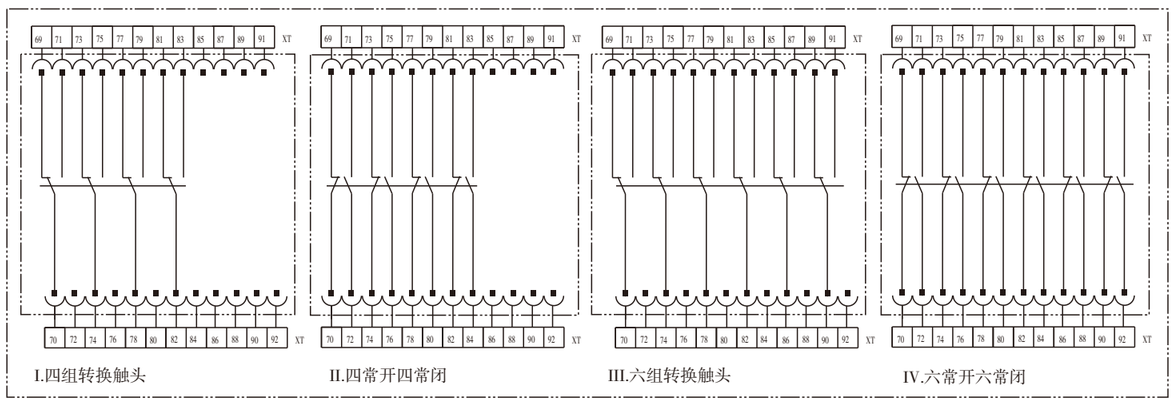



| | | |
|---|---|---|
| SB2 | 分励按钮 | Shunt button |
| SB3 | 合闸按钮 | Closing button |
| Q | 欠电压脱扣器或欠电压延时脱扣器 | Under-voltagerelease |
| F | 分励脱扣器 | Shunt release |
| X | 合闸电磁铁 | Closing electromagnet |
| M | 贮能电机 | Charging motor |
| SA | 电动机行程开关 | Limit switch |
| XT | 断路器两次回路接线端子 | Terminals |
| FU | 熔断器 | Fuse |
| AX | 断路器辅助开关 | Auxiliary switch |

注：虚线部分由用户自接。若欠电压脱扣器、分励脱扣器、合闸电磁铁等额定电压不同应分别接不同电源。Wiring in the dashed line is done by users themselves. Power supply is different for different rated voltage of Q, F,X etc

下表中，√为必备附件的功能接线；○为选择附件的功能接线. In the following table, √: standard configuration , ○: optional configuration.

辅助开关型式 The pattern of auxiliary switch




I.四组转换触头 Four pairs of changeover contacts

II.四常开四常闭 Four pieces of normally-open contacts and four pieces of normally-closed contacts

III.六组转换触头 Six pairs of changover contacts

IV.六常开六常闭 Six pieces of normally-open contacts and six pieces of normally-closed contacts

| 端子号Termina | 功能Function | | 功能接线 Function wiring |
|---|---|---|---|
| 31, 32 | 欠电压脱扣器（应接在主回路中） | Connect with under-voltage release | ○ |
| 33, 34 | 分励脱扣器 | Connect with shunt release | √ |
| 35, 36 | 合闸电磁铁 | Connect with closing electromagnet | √ |
| 37,38,39 | 电动(电机)贮能。37,38可直接接电源（自动预贮能），也可串接常开按钮后接电源（手动预贮能） | Connect with Motor driven operating mechanism. Power supply directly (auto energy prestore) or power supply with a NO(normal open) button simultaneously ( manual energy prestore) with 37,38. | √ |
| 41,42,43 | 合闸准备就绪电气指示 | Ready-for-close indication | ○ |
| 45,46,47 | 储能信号电气指示 | charging indication | ○ |
| 69~92 | 辅助开关连接端子 | Connecting terminals of auxiliary switch | √ |
| 93,96 | 抽屉座“连接”位置指示（AC250V 1A） | “Connected” position indication （AC250V 1A） | ○ |
| 94,96 | 抽屉座“试验”位置指示（AC250V 1A） | “Test” position indication（AC250V 1A） | ○ |
| 95,96 | 抽屉座“分离”位置指示（AC250V 1A） | “Separated” position indication（AC250V 1A） | ○ |

## ●订货规范

无过电流保护断路器订货规范

(请在__上填上数字，☐内打上 √)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 用户单位 | | | 订货台数 | | 订货日期 | | |
| 型号 CW3V - _____ /CBI | | | ☐陆用 | | ☐湿热带型 (TH型) | | |
| 额定电流 In = _____ A | | | 额定电压 ☐ AC400V | ☐ AC690V | ☐ AC1140V | | |
| 安装方式 ☐ 固定式 | | | ☐ 抽屉式 | | | | |
| 联接方式 ☐ 水平 | ☐ 垂直 | ☐ 上垂直下水平 | ☐ 上水平下垂直 (仅抽屉式) | | | | |
| 附件配置 | FFT分励脱扣器 | ☐ AC230V | ☐ AC400V | ☐ DC220V | ☐ DC110V | | |
| | FHD合闸电磁铁 | ☐ AC230V | ☐ AC400V | ☐ DC220V | ☐ DC110V | | |
| | FDC电动操作机构 | ☐ AC230V | ☐ AC400V | ☐ DC220V | ☐ DC110V | | |
| | FFC辅助开关 ☐ 4组转换触头 | ☐ 4常开4 常闭 | 特殊形式 ☐ 6组转换触头 | ☐ 6常开6常闭 | | | |
| 选择附件 | ☐ FQT欠电压脱扣器 | ☐ AC230V | ☐ AC400V | | | | |
| | | ☐ 瞬时型 | 延时型 ☐ 0.5s | ☐ 1s | ☐ 2s | ☐ 3s | |
| | ☐ FFS 分闸锁定装置 | ☐ 一锁一钥匙 | ☐ 二锁一钥匙 | ☐ 三锁二钥匙 | | | |
| | ☐ FLS 机械联锁 | 二台断路器 ☐ 钢缆联锁 | ☐ 联杆联锁 (上下联锁) | | | | |
| | | 三台断路器 ☐ 钢缆联锁方式三 | ☐ 联杆联锁方式一 | ☐ 联杆联锁方式二 | ☐ 联杆联锁方式三 | | |
| | ☐ FAN 按钮锁定装置 | ☐ FXG 相间隔板 | ☐ FJS 计数器 | | | | |
| | ☐ FXM 合闸准备就绪电气指示模块 | ☐ FWZ 抽屉座位置电气指示装置 | ☐ FCZ储能信号电气指示装置 | | | | |

Order form of breakers not fulfulling the requirement for overcurrent protection

(Please fill numbers in ___ or mark√ in ☐)

| | | | | | |
|---|---|---|---|---|---|
| Name | | Order amount | | Order data | |
| Type CW3V – _____ /CBI | | | ☐ On Land ☐ Humid tropical(TH) | | |
| Rated current In = _____ A | | Rated voltage | ☐ AC400V ☐ AC690V ☐ AC1140V | | |
| Connection ☐ Fixed | | | ☐ Draw-out | | |
| Connection ☐ Horizontal | ☐ Vertical | | ☐ The upper vertical and the below horizontal | | ☐ The below vertical and the upper horizontal (only draw-out) |
| Normally-deployed accessories | FFT Shunt release | ☐ AC230V | ☐ AC400V | ☐ DC220V | ☐ DC110V |
| | FHD Switching-on eletromagnet | ☐ AC230V | ☐ AC400V | ☐ DC220V | ☐ DC110V |
| | FDC Power-driven operation mechanism | ☐ AC230V | ☐ AC400V | ☐ DC220V | ☐ DC110V |
| | FFC Auxiliary switch ☐ Four groups of changeover contacts | ☐ Four pieces of normally-opened contacts | Exceptional pattern ☐ Six pieces of normally-opened contacts | ☐ Six pieces of normally-opened contacts | |
| Choice of accessories | ☐ FQT Under-voltage release | ☐ AC230V | ☐ AC400V | | |
| | | ☐ Under-voltage instantaneous release | Under-voltage time delay release ☐ 0.5s | ☐ 1s | ☐ 2s ☐ 3s |
| | ☐ FFS "Switching-off" lock mechanism | ☐ One lock and one key | ☐ Two lock and one key | ☐ Three lock and two key | |
| | ☐ FLS Mechanical interlock | Two sets of circuit breakers ☐ Steel lock interlock | ☐ Link rod interlock | | |
| | | Three sets of circuit breakers ☐ Steel lock interlock | ☐ Pattern one of rod interlock | ☐ Pattern two of rod interlock | ☐ Pattern three of rod interlock |
| | ☐ FAN "Button" locking device | ☐ FXG Isolation plate between phases | ☐ FJS Counter | | |
| | ☐ FXM electrical module for indication of ready-for-close | ☐ FWZ electrical indication mechanism of socket's position | | | |
| | ☐ FCZ electrical indication mechanism of storage signal Accessories monitoring units | | | | |

# 全国一级经销商明细表

## 北京

北京欣凯通机电有限公司 010-66162644
北京市北方森源电气有限责任公司 010-87581702
众业达电气(北京)有限公司 010-67315343

## 天津

天津市强强电器科技有限公司 022-83715527
天津众业达电气有限公司 022-86326008

## 上海

上海企开电器设备有限公司 021-56319844
上海森昊电气有限公司 021-54791857
上海泰耀机电设备有限公司 021-57428230
上海华启电气设备有限公司 021-56319844
上海斐格电气有限公司 021-24205696
上海众业达电器有限公司 021-56988198

## 重庆

重庆众业达电器有限公司 023-63056952

## 福建

泉州市恒源电力设备有限公司 0595-22587087
厦门亿合电器有限公司 0592-5223466
众业达电气（厦门）有限公司 0592-5976058
福州众业达电器有限公司 0591-83802051

## 浙江

杭州华森电器有限公司 0571-86947817
杭州天源机电设备有限公司 0571-87244850
杭州众业达电器有限公司 0571-88260931
乐清市新格电气有限公司 0577-62727313
宁波市江东腾辉电器有限公司 0574-87890910
宁波众业达电器有限公司 0574-87052331
宁波安能电气有限公司 0574-87239079
金华三变电气有限公司 13605798321
众业达电气温州有限公司 0577-88919098

## 安徽

合肥皖为电气设备工程有限责任公司 0551-62884402
合肥环亚机电贸易有限责任公司 0551-62871030
众业达电气安徽有限公司 0551-65670231

## 江苏

南京扬力电器有限公司 025-84585297
南京兰珀电气工程有限公司 025-85283021
众业达电气南京有限公司 025-58833275
常州市中环电器有限公司 0519-88867161
镇江兆丰电器有限公司 0511-88320888
苏州苏新机电设备有限公司 0512-67571866
苏州市中信机电设备有限公司 0512-65236366
苏州华夏华通电气有限公司 0512-67702333
常熟普利通电气有限公司 0512-52781789
常熟市中通电力设备有限责任公司 0512-52853511
常熟市润源电气设备销售有限公司 0512-52110269
常熟市创达电气物资有限责任公司 0512-52728292
无锡智帆达商贸有限公司 0510-82736734
无锡众业达电器有限公司 0510-85431468
南通正源电气有限公司 18751322091
扬州易尔法电气有限公司 0514-87895515
连云港市希门自动化电器设备有限公司 0518-85013959
徐州泛得电子有限公司 0516-83861527
海安巨龙工贸有限公司 0513-88839628
淮安康泰电气设备有限公司 0517-89897555
宿迁市常开电气有限公司 0527-88803336

## 山东

莱芜汇鑫实业有限公司 13563400899
山东亘源电力工程有限公司 0531-86018833
淄博新能机电设备有限公司 0533-2186118
济南久业电气设备有限公司 0531-85869178
烟台信谊电气技术有限公司 0535-6105866
江苏华晟电器设备有限公司山东电气技术中心 0531-88950385
济南众业达电器有限公司 0531-81216270
青岛众业达电器有限公司 0532-55557512

## 江西

江西佳创实业有限公司 0791-88317951
九江安力达电气有限公司 0792-7031115
南昌众业达电气有限公司 0791-88205101

## 广东

广州市友朋电气设备有限公司 020-34527080
广州市众业达电器有限公司 020-81279615
佛山市君鹏机电设备有限公司 0757-83811990
佛山市嘉合贸易有限公司 0757-83397660
东莞市运通泰电气科技有限公司 0769-22028877
深圳市华冠电器销售有限公司 0755-83928099
众业达电气（深圳）有限公司 0755-25874404
众业达电气股份有限公司（含子公司） 0754-88739376
汕头市新兴工业配套材料有限公司 0754-88681888
汕头市众业达机电设备有限公司 0754-88739149

## 湖南

长沙市康发电器有限公司 0731-84422858
长沙众业达电器有限公司 0731-85453248

## 湖北

武汉万千新能电气有限公司 027-87312243
武汉圣天科技有限公司 027-82706552
武汉众业达机电设备有限责任公司 027-87929423
众业达电气襄阳有限公司 0710-3721652

## 广西

南宁市德控机电设备有限责任公司 0771-3212829
广西众业达电气有限公司 0771-3809503

## 河北

河北华尔电气有限公司 0311-87227761
石家庄市众业达电气自动化有限公司 0311-89624271
石家庄市晓赛电气设备贸易有限公司 13803115659
唐山众业达电气设备有限公司 0315-5772709

## 河南

河南中电电器有限公司 0371-66965984
河南百望电气设备有限公司 0371-63329025
郑州众业达电器有限公司 0371-68772833
众业达电气洛阳有限公司 0379-60697679

## 四川

成都慧永电器成套设备有限公司 028-68003527
成都众业达电器有限责任公司 028-87560470

## 陕西

陕西新力源电气有限公司 029-88348188
陕西众业达电器有限公司 029-87452381
西安西菱电器机械设备有限公司 029-88320213

## 云南

昆明惠尔电气有限公司 0871-63835808
昆明众业达自动化设备有限公司 0871-68065589

## 宁夏

银川同正电气有限公司 0951-6014483

## 山西

山西三为电控设备成套有限公司 0351-6521630
山西常顺电器销售服务有限公司 0351-7023860
山西众业达电器有限公司 0351-6386456

## 新疆

众业达新疆电气有限公司 0991-4523128

## 辽宁

沈阳市新业物资实业公司 024-22734762
众业达电气（沈阳）有限公司 024-88505149
鞍山市耐特机电系统工程有限公司 0412-5230221
众业达电气（大连）有限公司 0411-86713487

## 吉林

长春市金蟾经贸有限公司 0431-84788961

## 黑龙江

哈尔滨北低日月机电设备有限公司 0451-88387734
众业达电气哈尔滨有限公司 0451-83336586

## 内蒙古

包头市杰德自动化工程有限公司 0472-6180955
内蒙古宇欣机电科技有限公司 0471-6512281

## 海南

海南华胜电气设备有限公司 0898-66226803

## 甘肃

甘肃众业达电器有限公司 0931-8406069