中国驰名商标

CW3V系列智能型
真空万能式断路器

CW3V SERIES INTELLIGENT VACUUM CIRCUIT-BREAKERS

- 最小化，通用化
- 真空化，免维护
- 高分断，应用广
- 长寿命，更安全
- 智能化，多功能
- 可通信，网络化

2013.03

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)

国家火炬计划重点高新技术企业证书
StateTorch Plan Key High-tech Enterprise

国家科学技术进步奖证书
National Awards for Science and Technology Cerificate

国家科学技术进步奖证书
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质量管理体系认证证书
Quality Management System Certificate

环境管理体系认证证书
Environmental Management System Certificate

职业健康安全管理体系认证证书
Occupational Health And Safety Management System Certificate

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

测量管理体系认证证书
Certificate Of Conformity For Measurement Management Systems

中国驰名商标
China Well-known Trademark

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

博士后科研工作站
Postdoctoral Programme

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系列
高压真空断路器


CV2-12系列
高压真空断路器


CV1-24系列
高压真空断路器


CV1-40.5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


CW3V系列
智能型真空万能式断路器

塑料外壳式断路器


CM1系列
塑料外壳式断路器


CM1E系列
电子式塑壳断路器


CM1Z系列
智能型断路器

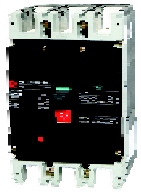

CM1L系列
带剩余电流保护塑壳断路器


CM1EL系列
带剩余电流保护
电子可调式断路器


CM2系列
塑料外壳式断路器


CM2Z系列
智能型塑壳断路器


CM2L系列
带剩余电流保护塑壳断路器


CM3系列
塑料外壳式断路器


CM5系列
塑料外壳式断路器


CM5Z系列
塑料外壳式断路器

自动转换开关


CA1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)

接触器和过载继电器


CK3系列接触器


CJR3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

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

电动机软起动器

CR1系列
电动机软起动器

CR2系列
电动机软起动器

电动机保护器

CD4系列
智能马达保护器

控制和保护电器

CB1系列
控制和保护开关电器(CPS)

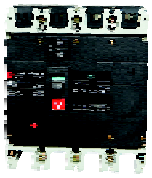
变频调速

CF1系列
通用变频器

光伏发电用产品

CS1G系列三相并网型
光伏发电逆变器

CW3G系列
隔离开关(AC，DC)



CM3DC系列
塑料外壳式断路器

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

CE1系列
智能型电力仪表

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

FWB1温度报警模块

智能化通信低压配电网络监控系列

●Riyear-PowerNet配电监控系统

●FCX3智能配电监控器

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

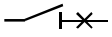
可选Modbus、Profibus、Devicenet、CAN任一协议直接通信输出，方便用户；并可通过本公司的CN1EG以太网适配器联接以太网网络

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：

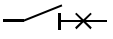
IEC60947-1及GB 14048.1-2006 低压开关设备和控制设备 总则

IEC60947-2及GB 14048.2-2008 低压开关设备和控制设备 断路器

IEC60947-4-1及GB 14048.4 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:

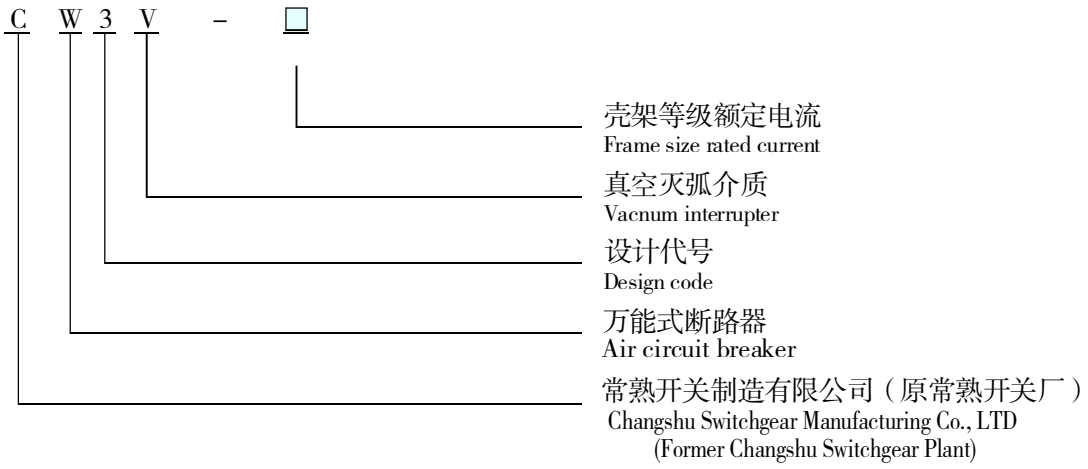
IEC60947-1 and GB14048.1-2006 Low-voltage switchgear and controlgear General rules

IEC60947-2 and GB14048.2-2008 Low-voltage switchgear and controlgear Circuit-breakers

IEC60947-4-1 and GB14048.4 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



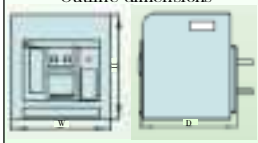
正常使用条件和安装条件 NORMAL SERVICE AND MOUNTING CONDITIONS

- 周围空气温度-5℃～+40℃，且24h的平均值不超过+35℃；
- 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；
- 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。

- Ambient temperature: -5℃ ~ +40℃ and the average in 24h below +35℃;
- 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 degree: 3 grade;
- Installing category: IV for main circuit; III for other auxiliary and control circuits;
- The breakers are used in electromagnetic environment A;
- The vertical gradient: no more than 5°;
- There must be no explosive medium, no gas which would corrode metal or any conducting dust which would destroy the insulation;
- The circuit breakers should be installed in the compartment of switchgear cabinet with doorframes fixed additionally. Protection grade up to IP40.

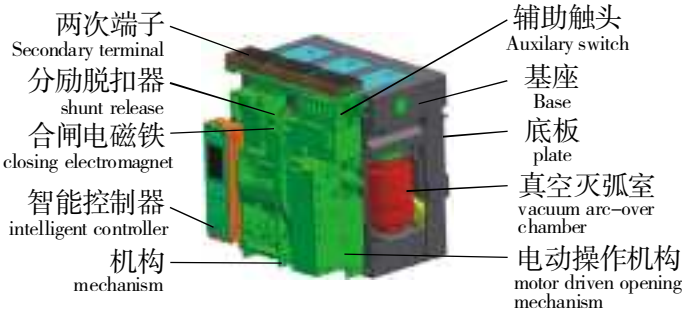
主要技术指标 MAIN TECHNICAL INDEX

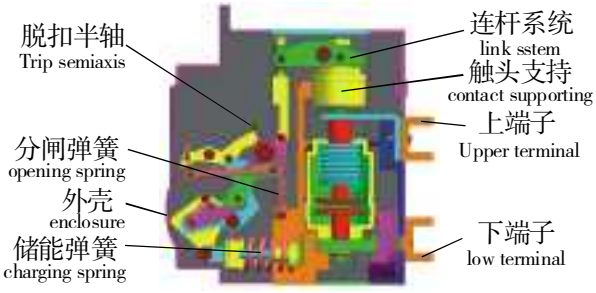
型 号 Type designation			CW3V-2000	CW3V-3200
壳架等级额定电流Inm(A) Frame size rated current			2000	3200
额定电流In(A) Rated current			400/630/800/1000/1250/1600/2000	630/800/1000/1250/1600/2000/2500/2900/3200
额定工作电压Ue(V) Rated operational voltage			AC50Hz/60Hz, 400、690、1140	
额定绝缘电压Ui(V) Rated insulation voltage			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
全分断时间（无附加延时）（ms） Full-breaking time(without aditional delay)			25~30	
闭合时间（ms） Closing time			最大70	
电气寿命（次） Electrical durability(times)			15000	10000
机械寿命（次） Mechanical durability(times)	免维护		15000	10000
	有维护		20000	15000

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			

*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：智能控制器具有保护/报警、测量、维护、可通信功能，并在AC1140V时，仅有EA35/36、EN35/36。
**Note:intelligent controllers have protection/alarm、measurement、maintemance and communication function,and only have EA35/36、EN35/36 type at the AC1140V.

工作原理 brief introduction of the operation





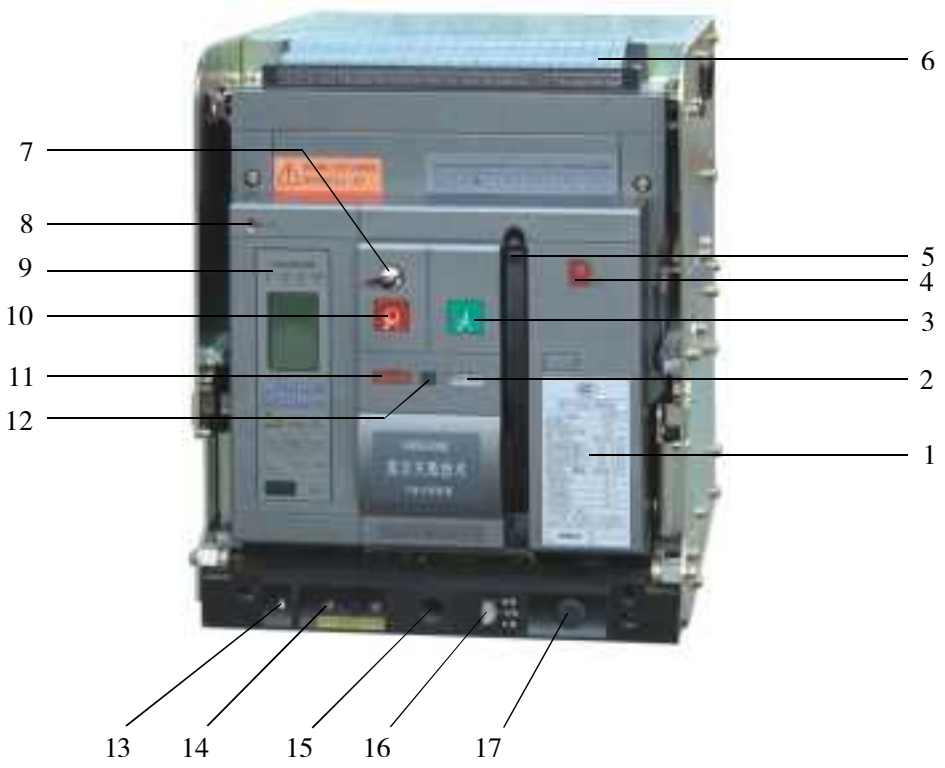
低压真空断路器由机构（自由脱扣机构）、电动操作机构、智能控制器、分励脱扣器、合闸电磁铁、连杆系统、触头支持、真空灭弧室、基座、底板和外壳等几部分组成。在合闸操作时，通过合闸电磁铁作用于机构合闸半轴，机构在储能弹簧作用下驱动连杆系统使真空灭弧室主触头闭合并将主触头锁定在闭合位置；在分闸操作或保护动作时，分励脱扣器或智能控制器作用于机构脱扣半轴，机构在分闸弹簧及触头反力作用下发生脱扣并驱动连杆系统使真空灭弧室主触头断开并保持在断开位置。由于采用了真空灭弧技术，灭弧室中不存在可被电离的物质。当开断电流触头分离时，在密闭真空管中形成金属蒸气放电弧柱，并一直维持到下一个电流过零点。在接近电流过零点时，导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（防跳跃功能），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(anti-leap tunction)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 Type EA35	EA36型 Type EA36	EP35型 Type EP35	EP36型 Type EP36	EQ35型 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 Type EQ36	EG35型，发电机保护型 Type EG35 which is the generator protection type	EG36型，发电机保护型 Type EG36 which is the generator protection type	EN35型 Type EN35	EN36型 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,consecutive parameter-setting and measurement function of current,voltage,energy,frequency and power	With such perfo-rmances as LED indication,consecutive parameter-setting and measurement function of current,voltage,energy,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		○

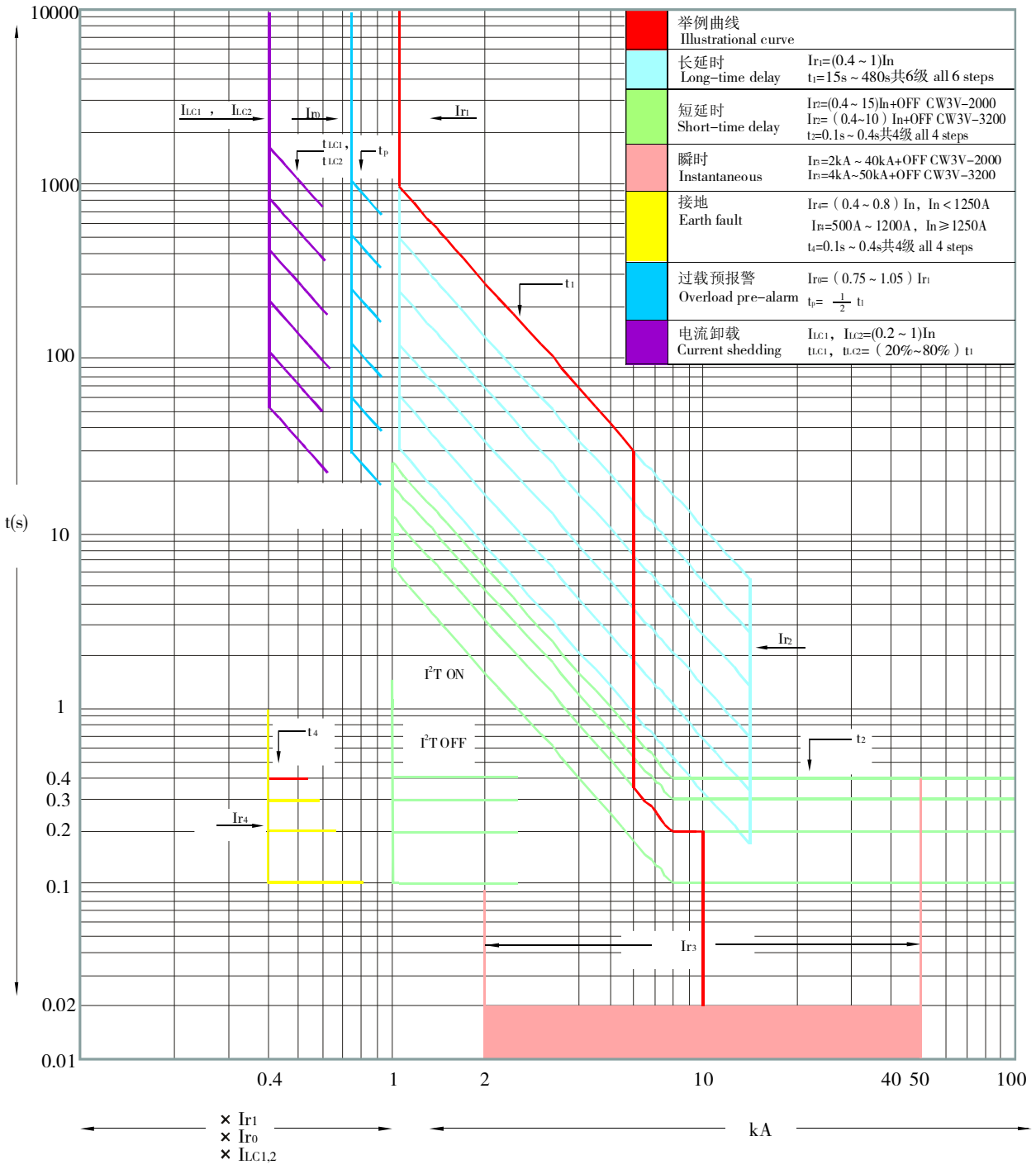
注：与电压相关的测量或保护，须提供电压输入（见本样本接线图）。
Note: Voltage input must be provided for voltage-related measurement or protection.

（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.

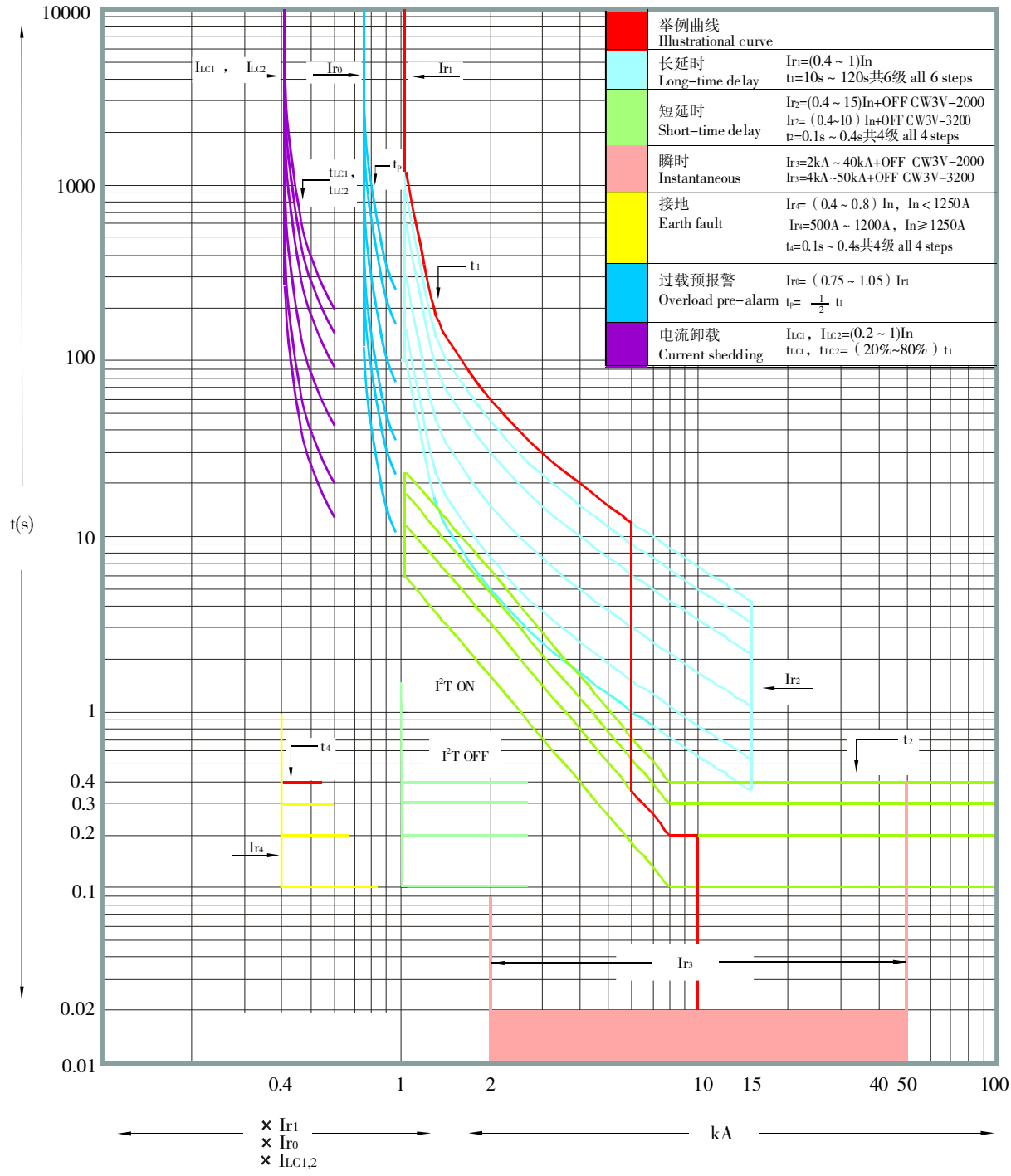
保护功能 Protection	动作值 Operating value	动作延时 Operating delay	可否关闭 Can off or not	热模拟 Thermal memory	ZSI
■ 过载长延时保护 Overload long-time delay	I_{r1}=(0.4~1)In	在1.5I_{r1}时(at 1.5I_{r1})， I^2t: t_1=(15-30-60-120-240-480)s It: t_1=(10-15-30-60-90-120)s I^4t:t_1=(60-120-240-480-960-1440)s	-	■	
递变级差 Successive grade	10A		注：EN控制仅只有I^2t过载长延时保护特性。 Note:I^2t long-time protction characteristic for EN controller.		
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 Inm=3200，I_{r2}=（0.4~10）In	在8I_{r1}时(At 8I_{r1}), 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：I^2t ON，当I≤8I_{r1}时，则反时限整定时间对应8Ir1；当I > 8I_{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 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% ≥3In: ± 15%				
■ 接地故障保护 Earth-fault	In < 1250A时，I_{r4}=(0.4~0.8)In 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	± 15%	± 15%			
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	Iro=(0.75-1.05)I_{r1}	tp=1/2t_1	-		
递变级差 Successive grade	0.05I_{r1}				
动作允差 Operating tolerance		± 10%			
■ MCR	In≤1000A时，15In 1000A < In < 2000A时，12In 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%	
■ 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~690V	动作阈值~690V Operating threshold~690V	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~1000V	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%	

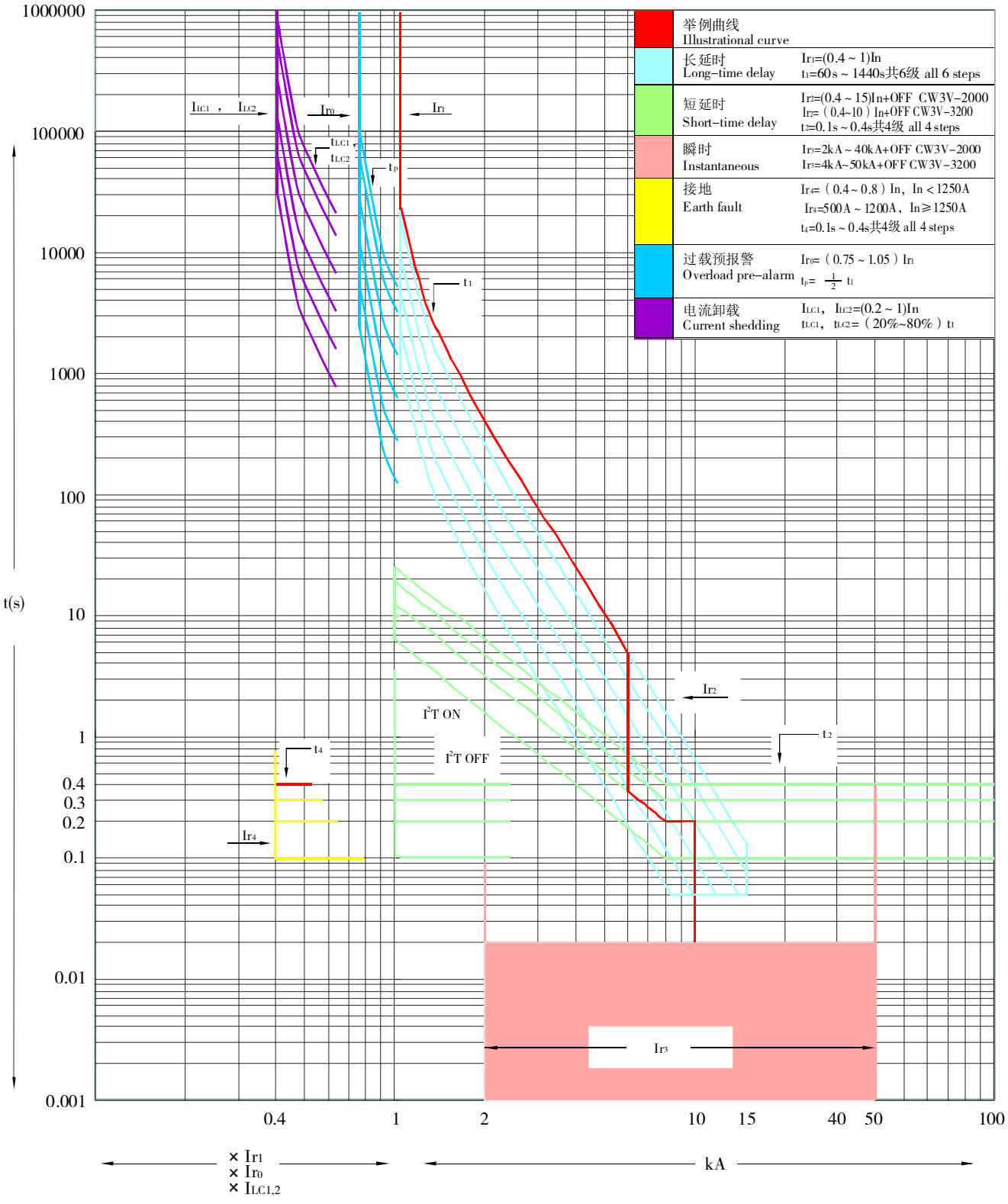
EN、EA、EP、EQ 智能控制器I^2t时间/电流特性曲线，CW3V–2000/3200
T/I (time/current) curve of I^2t of type EN, EA, EP and EQ intelligent controllers



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

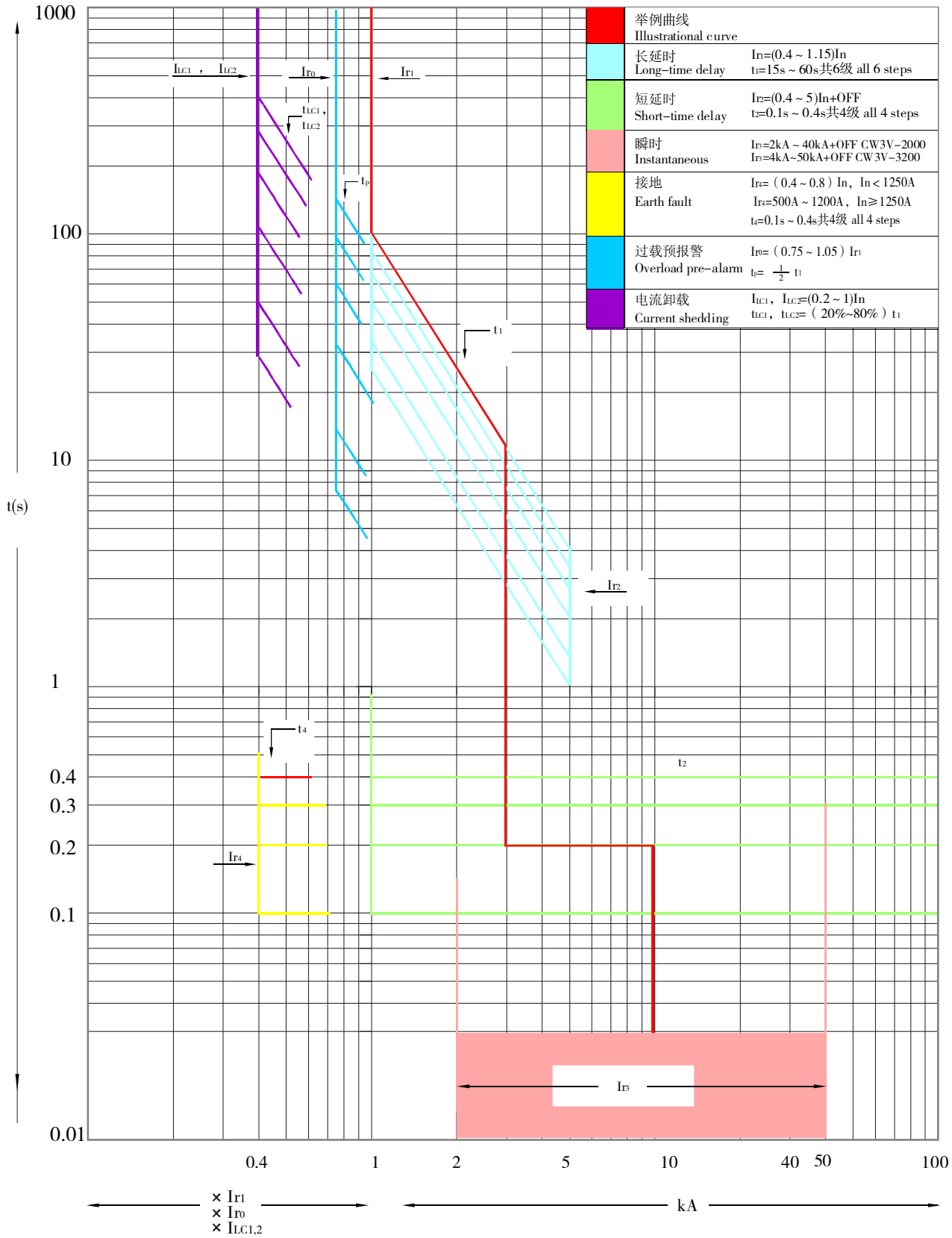
保护功能 Protection	动作值 Operating value	动作延时 Operating delay	可否关闭 Can off or not	热模拟 Thermal memory	ZSI
■ 过载长延时保护 Overload long-time delay	Ir_1=(0.4~1.15)In	在1.3Ir_1时 (at 1.3Ir_1), I^2t: t_1=(15–20–25–40–50–60)s	–	■	
递变级差 Successive grade	10A				
动作允差 Operating tolerance		± 10%			
■ 短路短延时保护 Short-circuit short-time delay	Ir_2=(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：动作特性为定时限 Note: Action characteristic definite.					
■ 瞬时保护 Instantaneous	Inm=2000，Ir_3=(2~40)kA 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% ≥3In: ± 15%				
■ 接地故障保护 Earth-fault	In < 1250A时，Ir_4=(0.4~0.8)In In≥1250A时，Ir_4=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	± 15%	± 15%			
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 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	Iro=(0.75–1.05)Ir_1	tp=1/2t_1	–		
递变级差 Successive grade	0.05Ir_1				
动作允差 Operating tolerance		± 10%			
■ MCR	In≤1000A时，15In 1000A < In < 2000A时，12In 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%	
■ 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~690V	动作阈值~690V Operating threshold~690V	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~1000V	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 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
■ 逆功率保护 Inverse power protection	20kW~500kW	20kW~动作阈值 20kW~operating threshold	0.2s~20s	1s~360s	■
递变级差 Successive grade	5kW	5kW	0.1s	0.1s	
动作允差 Operating tolerance	± 5%	± 5%	± 10%	± 10%	
■ 过频保护 Over-frequency protection	50Hz~65Hz	45Hz~动作阈值 45Hz~operating threshold	0.2s~5s	1s~360s	■
递变级差 Successive grade	0.5Hz	0.5Hz	0.1s	0.1s	
动作允差 Operating tolerance	± 0.5Hz	± 0.5Hz	± 10%	± 10%	
■ 欠频保护 Under-frequency protection	45Hz~60Hz	动作阈值~60Hz Operating threshold ~ 60Hz	0.2s~5s	1s~360s	■
递变级差 Successive grade	0.5Hz	0.5Hz	0.1s	0.1s	
动作允差 Operating tolerance	± 0.5Hz	± 0.5Hz	± 10%	± 10%	
■ 相序保护 Phase sequence protection	1,2,3或1,3,2(1, 2, 3 or 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%	

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 accuracy	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		$\overline{Ia}$、$\overline{Ib}$、$\overline{Ic}$、$\overline{IN}$	(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 Q S	-9999kW~+9999kW -9999kvar~+9999kvar -9999kVA~+9999kVA	± 2.5%	—	—	—	—
			-120MW~+120MW -120Mvar~+120Mvar -120MVA~+120MVA	—	—	± 2.5%	± 2.5%	± 2.5%
功率需用值测量 Demand power measurement		$\overline{P}$ $\overline{Q}$ $\overline{S}$	-120MW~+120MW -120Mvar~+120Mvar -120MVA~+120MVA	—	—	± 2.5%	± 2.5%	± 2.5%
功率因数测量 Power factor measurement		PF	-1~1	—	—	± 2.5%	± 2.5%	± 2.5%
电能测量 Energy measurement		E.P E.Q E.S	-9999MWh~+9999MWh -9999Mvarh~+9999Mvarh -9999MVAh~+9999MVAh	± 2.5%	—	—	—	—
			-10^{10}GWh~+10^{10}GWh -10^{10}Gvarh~+10^{10}Gvarh -10^{10}GVAh~+10^{10}GVAh	—	—	± 2.5%	± 2.5%	± 2.5%
频率测量 Frequency measurement			45Hz ~ 65Hz	± 0.1Hz	—	± 0.1Hz	± 0.1Hz	± 0.1Hz
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}） 基波相电压（U_{1N-1}、U_{2N-1}、U_{3N-1}） Fundamental line voltage Fundamental phase voltage	30V~690V	—	—	—	± 0.5%	± 0.5%
		基波功率 Fundamental power Pf Qf Sf	-120MW~+120MW -120Mvar~+120Mvar -120MVA~+120MVA	—	—	—	± 2.5%	± 2.5%
	谐波测量 Harmonic measurement	谐波电流含有率（HRIh） 谐波电压含有率（HRUh） Harmonic current ratio Harmonic voltage ratio	0~1000%	—	—	—	± 5%	± 5%
		电流总谐波畸变率[THDi、thdi] 电压总谐波畸变率[THDu、thdu] Total harmonic distortion of current 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I_{r1}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I_{r2}可调；

短路短延时定时限保护（I^2t OFF），整定电流I_{r2}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I_{r3}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 I_{r1} 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 I_{r2} can be adjusted.

For inverse short-circuit short-time delay protection (I^2t OFF) the setting current I_{r2} can be adjusted.

● Instantaneous short-circuit protection

The setting current I_{r3} 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I_{r4}可调

延时时间t_4可调

接地故障保护方式

1. 矢量和型

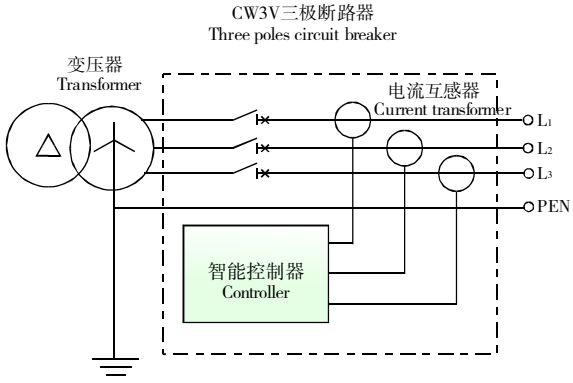
二、Earth–fault protection (can be OFF)

For definite earth–fault protection the setting current I_{r4} can be adjusted.

Delay time t_4 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

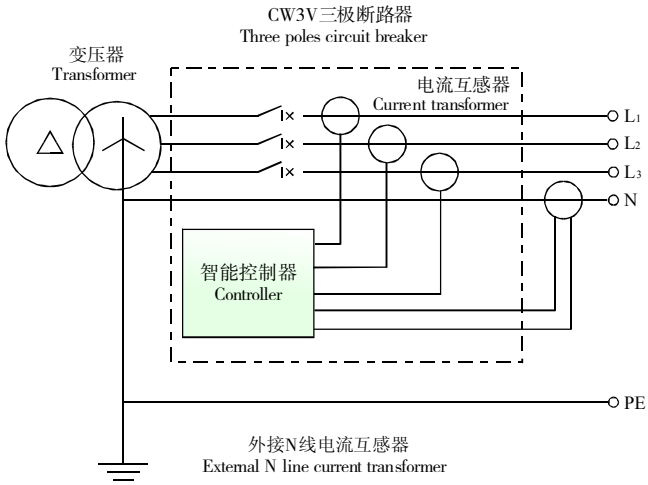
接地故障保护信号只取三相电流的矢量和

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

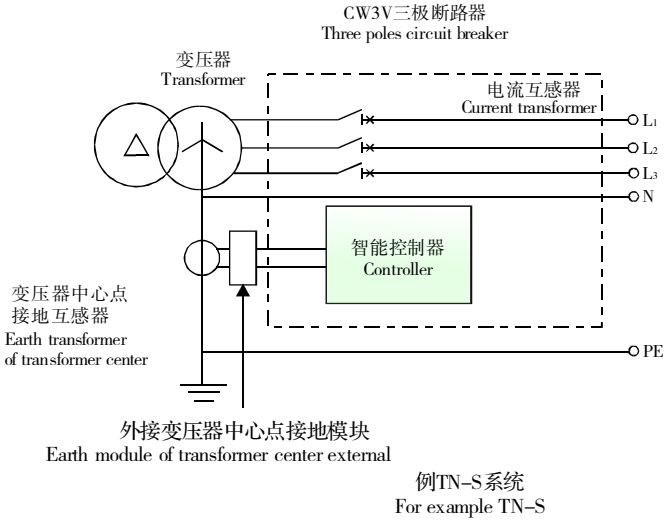
● CW3V circuit breakers with three poles are used in the power distribution system of TN–S.

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.

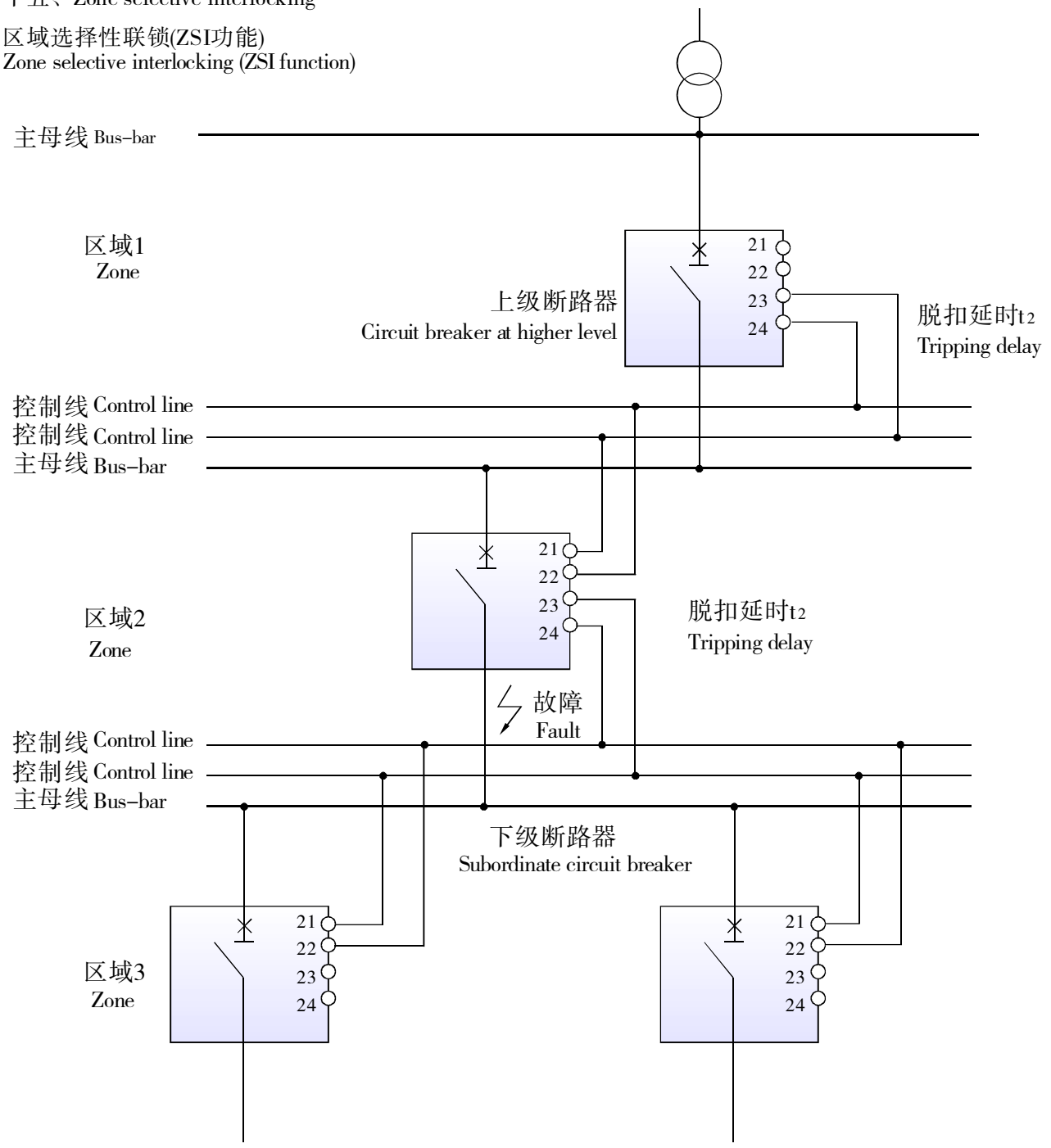
十四、Current shedding function

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

断路器在合闸过程中或控制器在通电初始化时，遇到短路短延时故障能立即转为瞬时分闸。

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)

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

When the circuit breaker or the controller is initially electrified, the circuit breaker would trip instantly if short-time short circuit fault occurred.

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)

The ratio of harmonic content in the periodical alternating quantum to RMS of fundamental component

周期性交流量中的谐波含量与其基波分量的方均根值之比(THD)用百分数表示。

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

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

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。

(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.

Communication data

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。

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.

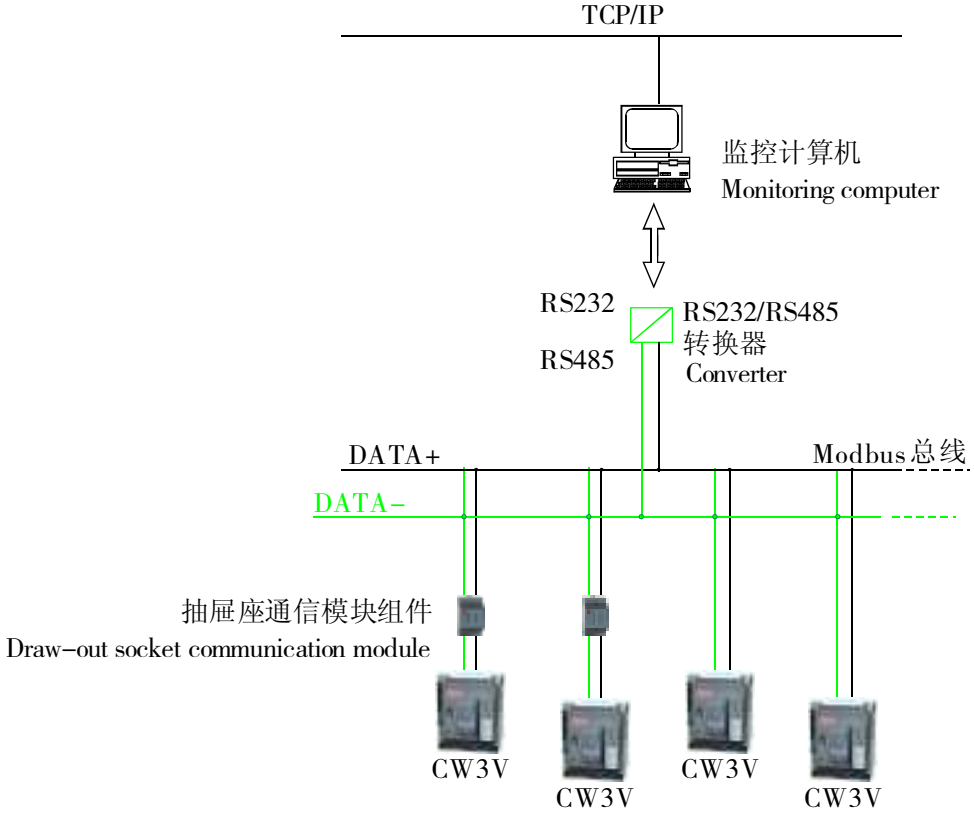
Recorded data of fault last time.

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			
分断时间 (ms) Breaking 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	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	(0.85~1.1)Us			
分断时间(ms) Breaking 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 4 groups of changeover contacts	4常开4常闭 4 pieces of normally-opened contacts (NO) and 4 pieces of normally-closed contacts(NC)	6组转换触头 6 groups of changeover contacts	6常开6常闭 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".

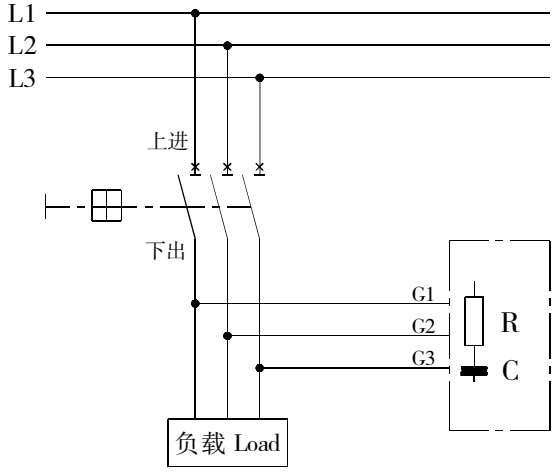
The padlock would be prepared by users, and its rod diameter should be in between ⌀4mm to ⌀8mm.

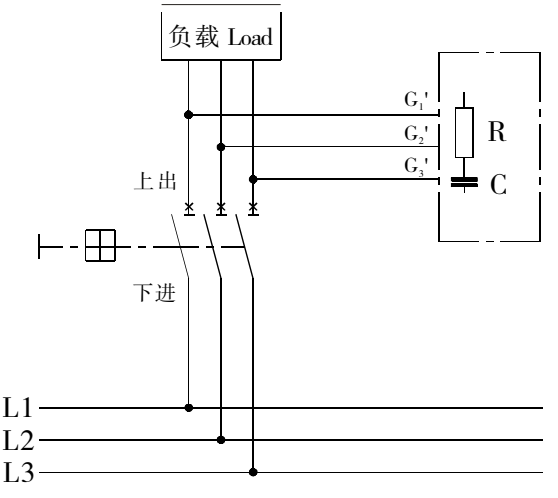
“分离”位置安全挂锁装置
Safety padlock mechanism at the position of "separated"

● 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) Power Consumption	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}	接地脱扣报警 Earth 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

非闭锁触头 Non-interlocking contact	故障引起的报警未消除，触头保持动作 It keeps operation until the failure alarm is gone.
闭锁触头 Interlocking contact	触头保持动作至被复位（复位菜单） It keeps operation until it is reset (reset menu).
时间延时触头 Time delay contact	触头保持在可调的时间延时内或被复位（复位菜单） 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 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 Rated operational voltage		约定发热电流Ith/A Conventional thermal current	额定工作电流Ie/A Rated operational current	额定控制容量 Rated control capacity
AC	230	5 （2路可编程输出模块为1A） （2 lines programmable output module is 1A）	AC-15：5 （2路可编程输出模块为1A） （2 lines programmable output module is 1A）	1200VA （2路可编程输出模块为230VA） （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) 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

● 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 Fitting breaker
FDH-80	CW3V-2000
FDH-120	CW3V-3200
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 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

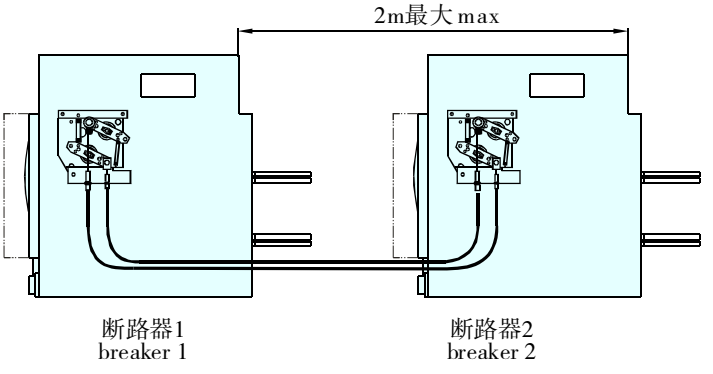
型号 Type	FCZ/W325
配用断路器 Fitting breaker	CW3V-2000/3200
额定工作电压Ue (V) Rated operational voltage	AC 230
约定发热电流Ith (A) Conventional thermal current	1
额定工作电流Ie (A) Rated operational current	1

● 两台平放断路器的钢缆联锁或两台叠装断路器的联杆联锁

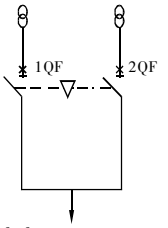
Two sets of circuit breakers put horizontally and interlocked with steel cable or stacked and interlocked with connecting rods

（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

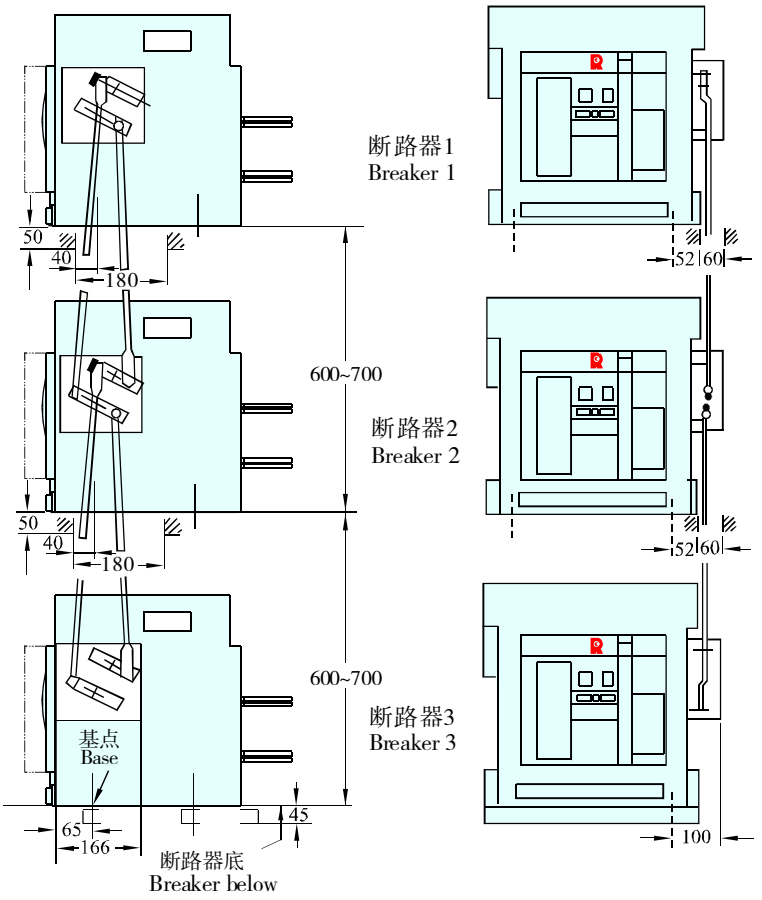
1QF	2QF
0	0
0	1
1	0

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平放断路器的钢缆联锁

Three sets of circuit breakers stacked and interlocked with connecting rods or three sets of circuit breakers put horizontally and interlocked with steel cable.

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

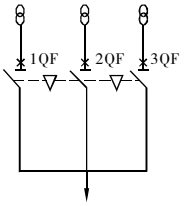


电路图 可能的运行方式

Wiring diagram Possible operation pattern

方式一：三个电源只能合一台断路器

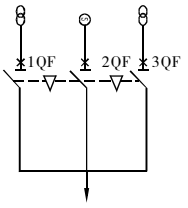
Pattern one: three sets of power supply can only close one set of circuit breaker



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

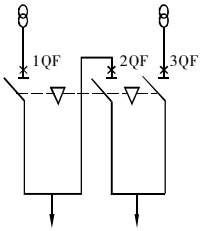
Pattern two: three sets of common power apply plus one set of alternate power supply



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

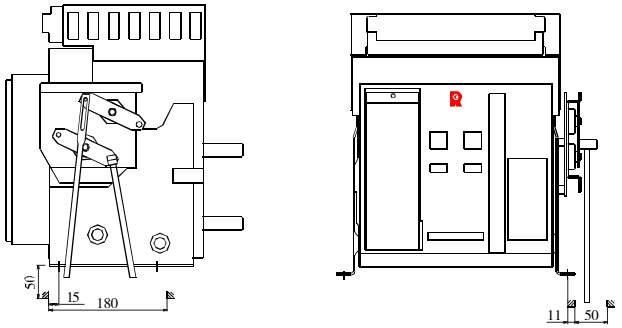
Pattern three: three sets of power supply plus one piece of coupling bus-bar



1QF	2QF	3QF
0	0	0
1	0	0
0	1	0
0	0	1
1	1	0
0	1	1
1	0	1

● CW3V-2000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。

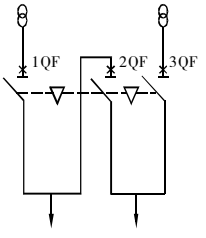
The style of interlock between three sets of circuit breakers see the interlock between two sets of circuit breakers. The maximum distance of two circuit breakers is 2m.

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 2 sets of circuit breakers steel lock interlock	CW3V-2000/3200
FLS/WL2	2台联杆联锁 2 sets of circuit breakers link rod interlock	CW3V-2000/3200
FLS/WG3	3台钢缆联锁 3 sets of circuit breakers steel lock interlock	CW3V-2000/3200
FLS/WL31	3台联杆联锁方式一 3 sets of circuit breakers link rod interlock type 1	
FLS/WL32	3台联杆联锁方式二 3 sets of circuit breakers link rod interlock type 2	
FLS/WL33	3台联杆联锁方式三 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断开按钮锁定在按下位置上，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 pressed 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，锁杆直径不大于⌀4mm。

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 no larger than ⌀4mm.

Pushbutton locking device

按钮锁定装置

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

● 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。

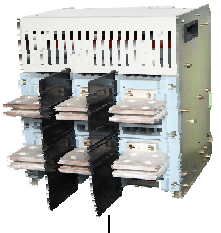
The counter can count mechanical operation times accumulatively and an exact number is presented.

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.



相间隔板
Interphase barriers

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

通信选择附件 Choice of communication accessories

● 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

● 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	307.2	486.4
CW3V-3200	——	614.4

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GB14048.2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 GB14048.2.

周围工作环境温度 Ambient environment temperature		+40℃	+45℃	+50℃	+55℃	+60℃
持续承载电流能力 Continual current-loading capacity	Inm=2000	1Inm	0.95Inm	0.90Inm	0.85Inm	0.80Inm
	Inm=3200	1Inm	0.92Inm	0.86Inm	0.80Inm	0.74Inm

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	5000
工频耐压(V) Power-frequency withstand voltage	3500	3150	2500	2000
工作电流修正系数 Correction factor of operational current	1	0.93	0.88	0.82

壳架等级额定电流Inm(A) frame size rated current	额定电流In(A) 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GB14048.2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 GB14048.2.

自动电源转换系统可以实现两路AC400V电源之间的转换供电，确保用户供电可靠性。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（厂方已连接）组成，同时，需与机械联锁配合使用。

● 转接器和自动转换控制器

转接器和自动转换控制器一起使用。转接器外形如图，它对常用电源的各相电压、备用电源的任一相电压进行检测，若被检测相发生115%Us过电压、75%Us欠电压、缺相或电源断电则发出动作指令。

自动转换控制器外形如图，可工作于四个状态：“自动”操作、强制采用“常用”电源、强制采用“备用”电源、“停止”（常用电源和备用电源均关断）。

转接器安装于开关柜安装板上，自动转换控制器安装于开关柜门板上，控制器至转接器及转接器至断路器的电缆长度为1.8m（超过1.8m用户订货时应注明）。

● 自动转换控制器按自动转换程序分：常用-备用间的自投自复（R型）、常用-备用间的自投不自复（S型）、常用-发电间的自投自复（F型）三种。自动转换控制器R型、S型、F型三

Automatic power supply switching system guarantees reliable power supplying for users by providing two lines of AC400V power supply alternatively. It consists of automatic controllers, switching unit and cables (already prepared by the manufacturer). The system should be used together with the mechanical interlock.

● Switching unit and automatic controller

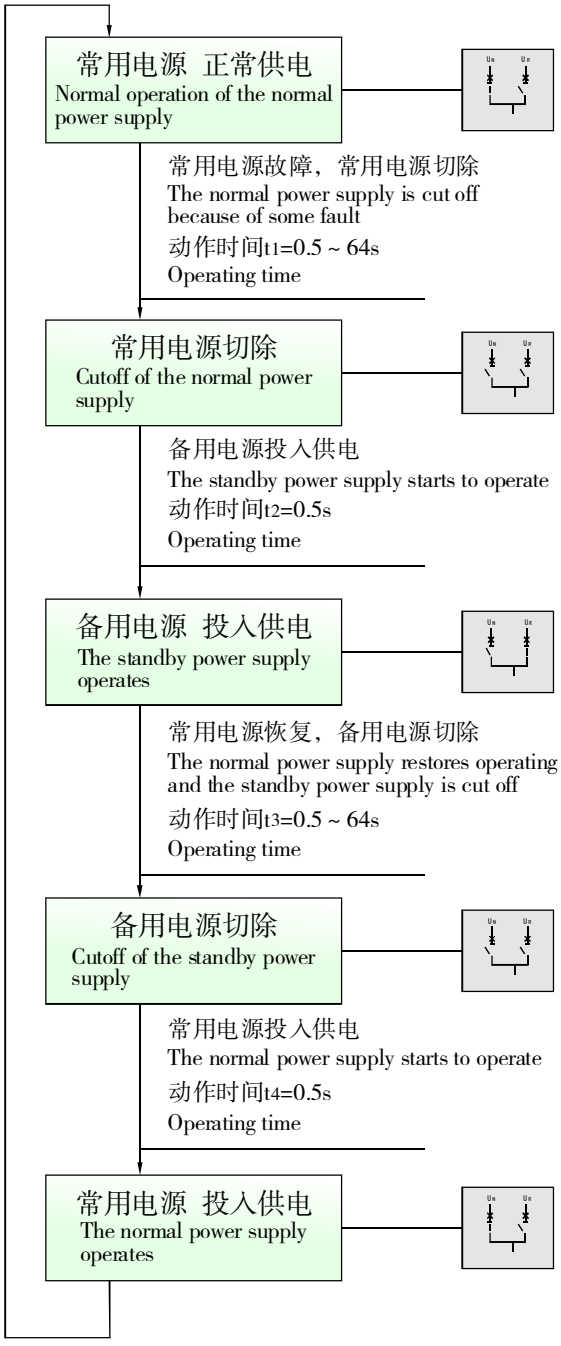
Switching unit works with the automatic controller. The switching unit detects voltage value on all phases of the normal power supply and the value on each phase of the standby power supply. In case of over-voltage of 115% Us, under-voltage of 75% Us, phase loss or power shortage happened at any phases, an operation command will be given out. The figure of the operation unit is as follows.

The automatic controller is shown on the page. It has four working positions that are "automatic" control, "normal"power supply, "standby" power supply and "stop"(both the normal power supply and the standby power supply can be turned off).

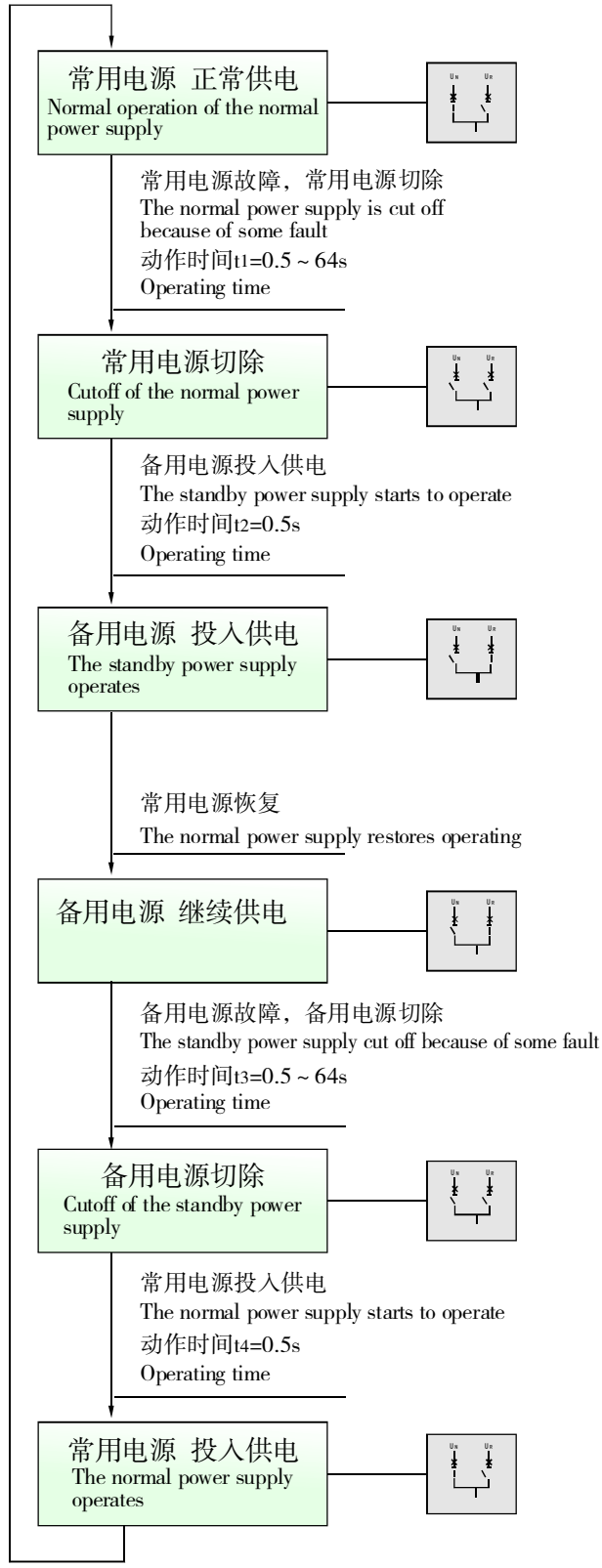
The switching unit is mounted on the mounting plate of switchboard while the automatic switch controller is mounted on the panel door of the switchboard.The cable between controller and switching unit is 1.8m , the same as the cable between switching unit and circuit breaker(Users should make special order when requiring for distance more than 1.8m).

● According to operation order the controller can be classified as Type R with automatic switch with restoration for normal supply to standby supply system, Type S with automatic switch but without restoration function for normal supply to standby supply system, Type F with automatic switch with restoration for normal supply to power generation supply system. The logic control diagram of the automatic controller of Type R, S and F is as follows.

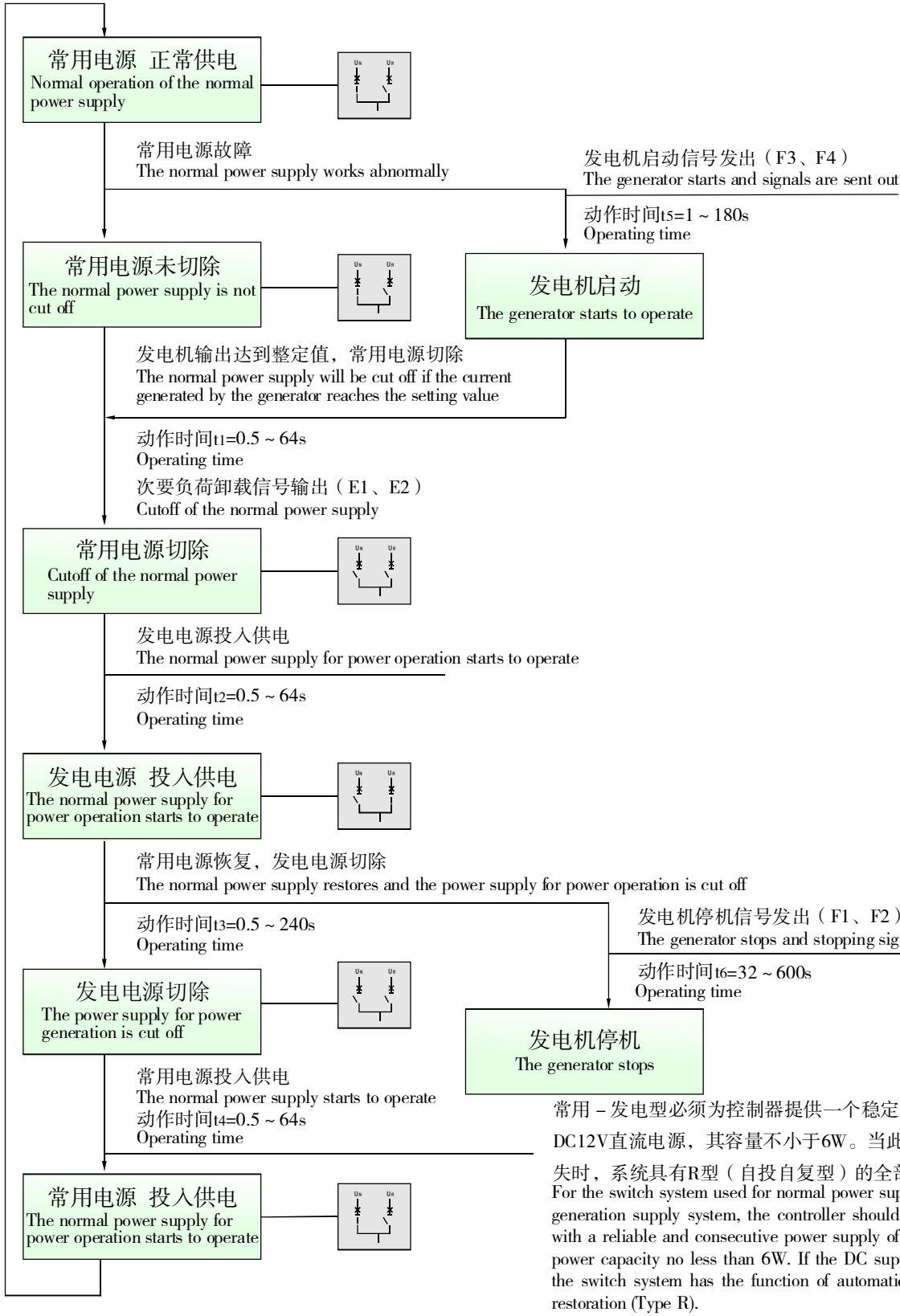
- 常用–备用间的自投自复（R型）
  Automatic switch with restoration for normal supply to standly supply (type R)



- 常用–备用间的自投不自复（S型）
  Automatic switch but without restoration for normal supply to standly supply (type S)



● 常用–发电电源间的自投自复（F型）
Automatic switch with restoration for normal supply to generation supply (type F)



常用－发电型必须为控制器提供一个稳定、不间断的DC12V直流电源，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 DC12V and power capacity no less than 6W. If the DC supply is cut off the switch system has the function of automatic switch and restoration (Type R).

● R型、S型、F型自动转换控制器控制特性：
Characteristics of the automatic controllers of type R, S and F

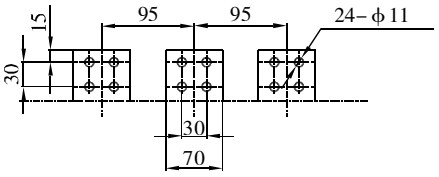
控制器种类 Controller type Adjustable for users	额定控制电源电压 Us(V) Rated voltage of power supply	转换断开延时时间 t1(s) Delay time before switching to open	转换接通延时时间 t2(s) Delay time before switching to close	返回断开延时时间 t3(s) Delay time before restoring opening	返回接通延时时间 t4(s) Delay time before restoring closing	发电指令延时时间 t5(s) Delay time before giving out the command to generate power	发电停机指令延时时间t6(s) Delay time before giving out the commandto stop power generation
R型 S型	AC230	0.5~64 用户可调 User adjustable	0.5	0.5~64 用户可调 User adjustable	0.5	–	–
F型	AC230	0.5~64 用户可调 User adjustable	0.5~64 用户可调 User adjustable	0.5~240 用户可调 User adjustable	0.5~64 用户可调 User adjustable	1~180 用户可调 User adjustable	32~600 用户可调 User adjustable

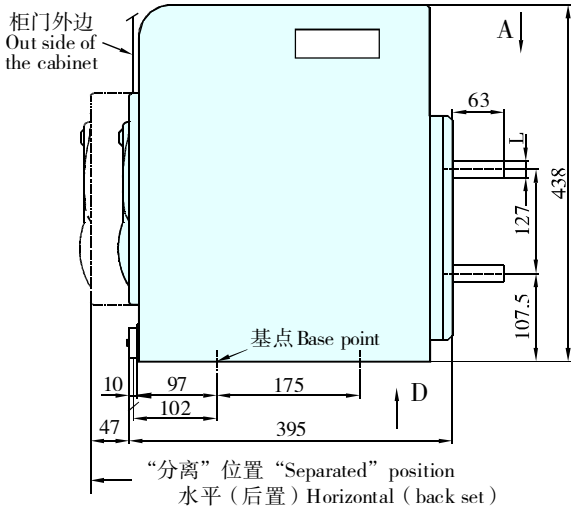
型号 Type	自动转换控制器型号 Automatic switch controller	配用断路器 Fitting breaker
FZZ/WTR	R	CW3V–2000/3200
FZZ/WTS	S	
FZZ/WTF	F	

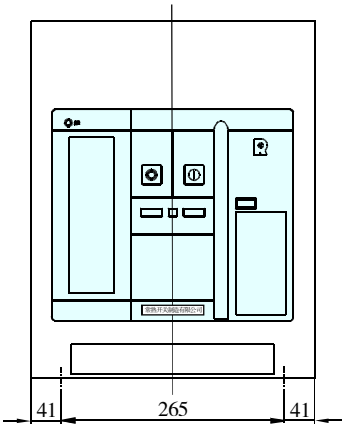
● CW3V-2000三极真空断路器（抽屉式）
Vacuum circuit-breaker with three poles(draw-out)

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

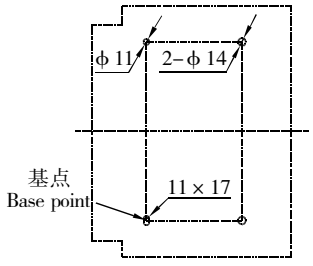
A向
Direction A

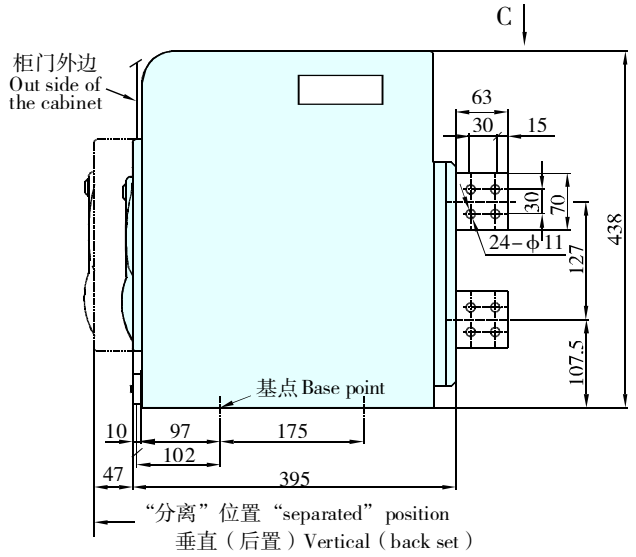




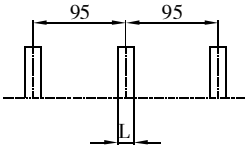


D向
Direction D



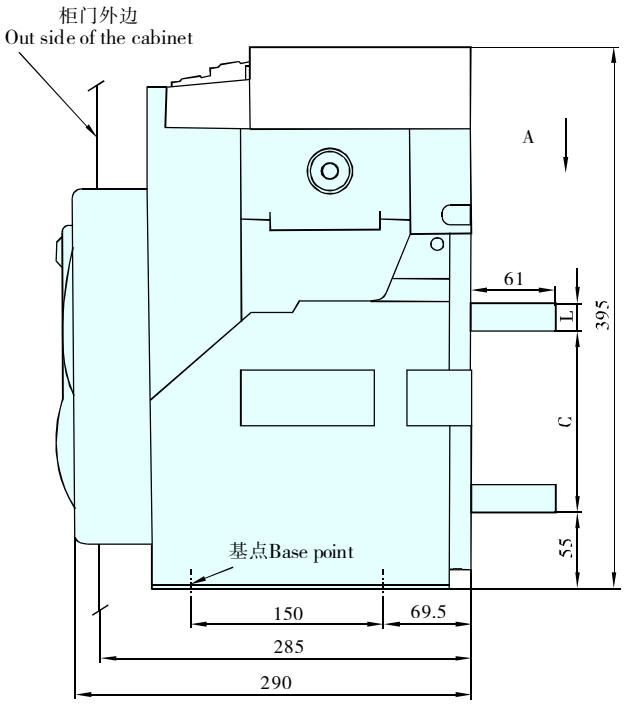


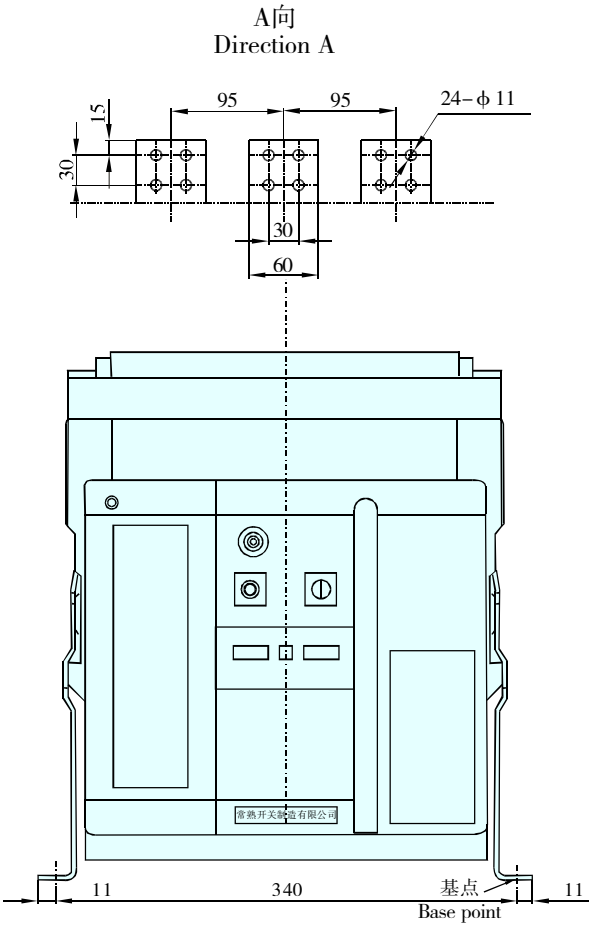
C向
Direction C



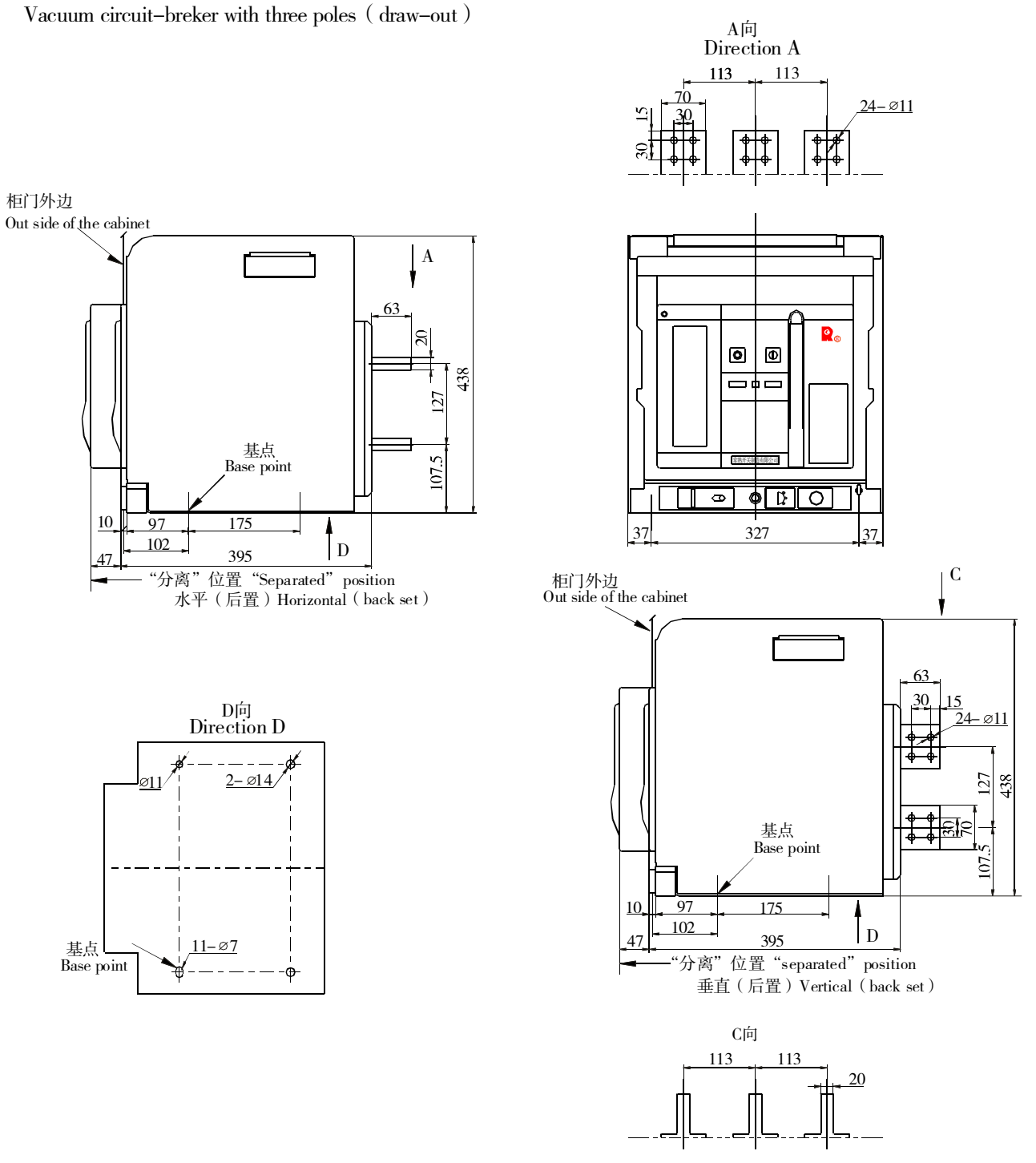
- CW3V-2000三极真空断路器（固定式）
  Vacuum circuit-breaker with three poles(fired type)

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

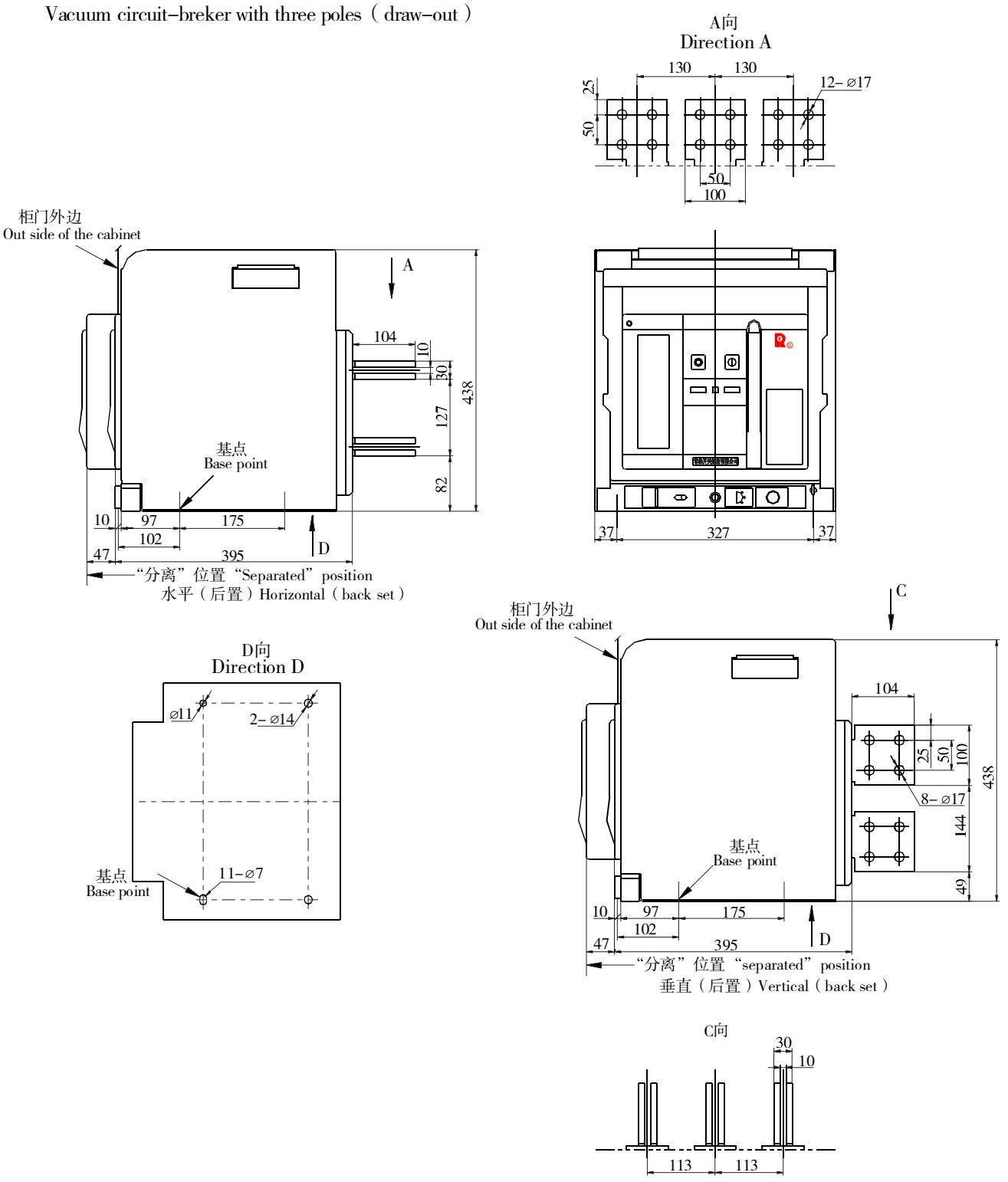




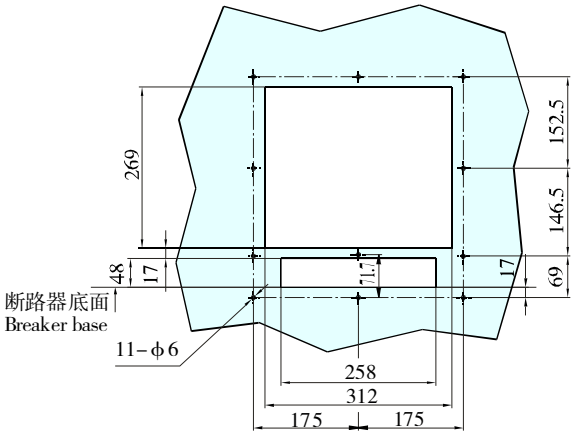
- CW3V-3200三极真空断路器（抽屉式），630A-1600A
  Vacuum circuit-breker with three poles（draw-out）



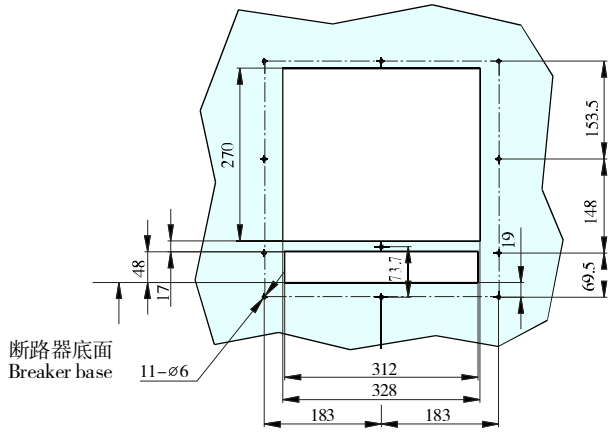
- CW3V-3200三极真空断路器（抽屉式），2000A-3200A
  Vacuum circuit-breker with three poles（draw-out）



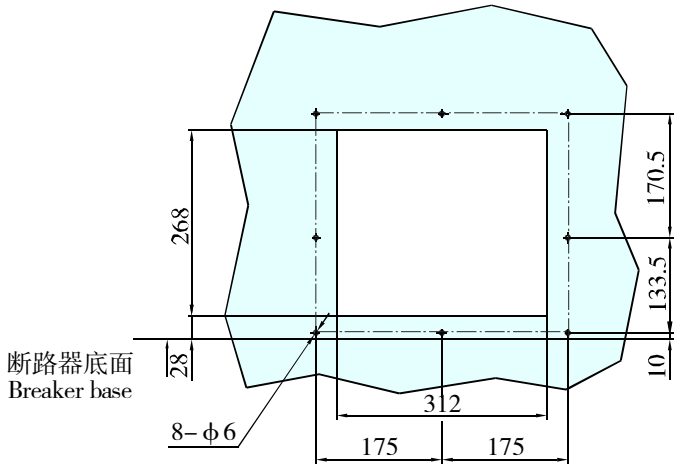
CW3V-2000真空断路器（抽屉式）
安装门框前盖开孔图
控制面板中心离框门右铰链最小距离为256mm
Vacuum circuit-breaker(draw-out type)
The drawing of cutout dimensions for mounting cover of doorframe
Distance from the panel center of citcuit breaker it the righting of cabinet door should be least 256mm



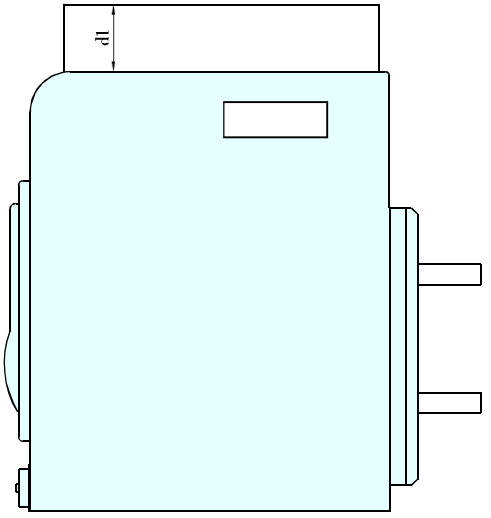
CW3V-3200真空断路器（抽屉式）
安装门框前盖配孔图
控制面板中心离框门右铰链最小距离为264mm
Vacuum circuit-breaker(draw-out type)
The drawing of cutout dimensions for mounting cover of doorframe
Distance from the panel center of citcuit breaker it the righting of cabinet door should be least 264mm

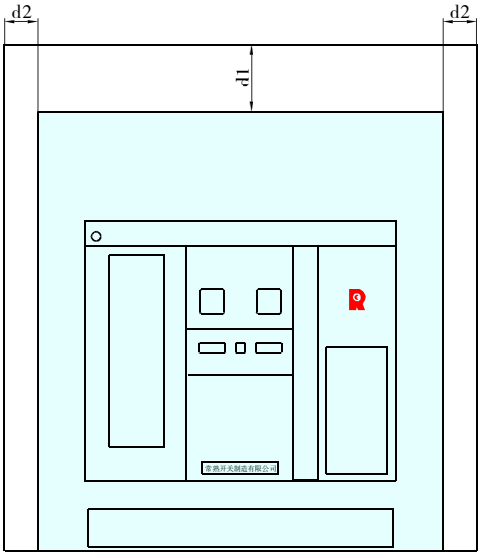


CW3V-2000真空断路器（固定式）
安装门框前盖开孔图
控制面板中心离框门右铰链最小距离为256mm
Vacuum circuit-breaker(fixed type)
The drawing of cutout dimensions for mounting cover of doorframe
Distance from the panel center of citcuit breaker it the righting of cabinet door should be least 256mm



● 抽屉式断路器 Draw-out breaker

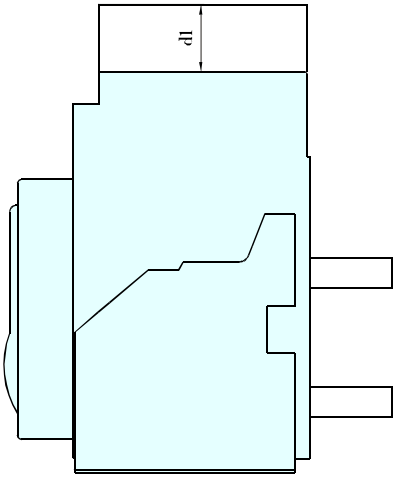


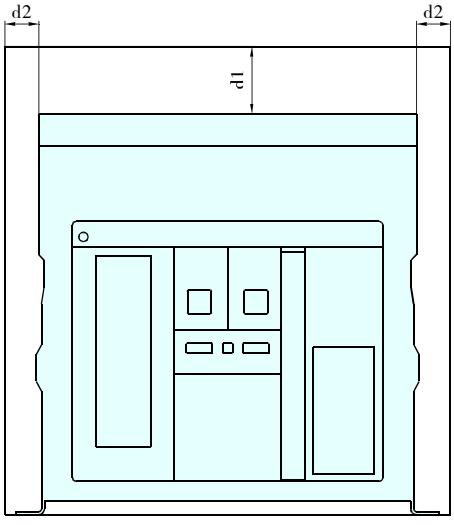


断路器与柜壁或带电部件最小距离
Minimn distance between breaker with switchboard wall or live part.

	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



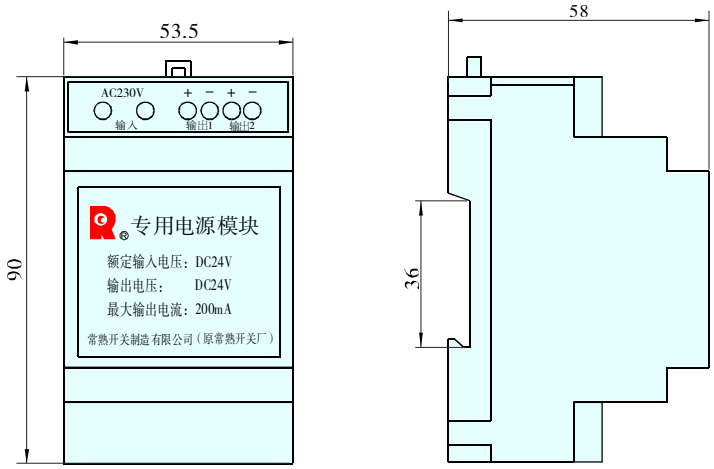


断路器与柜壁或带电部件最小距离
Minimn distance between breaker with switchboard wall or live part.

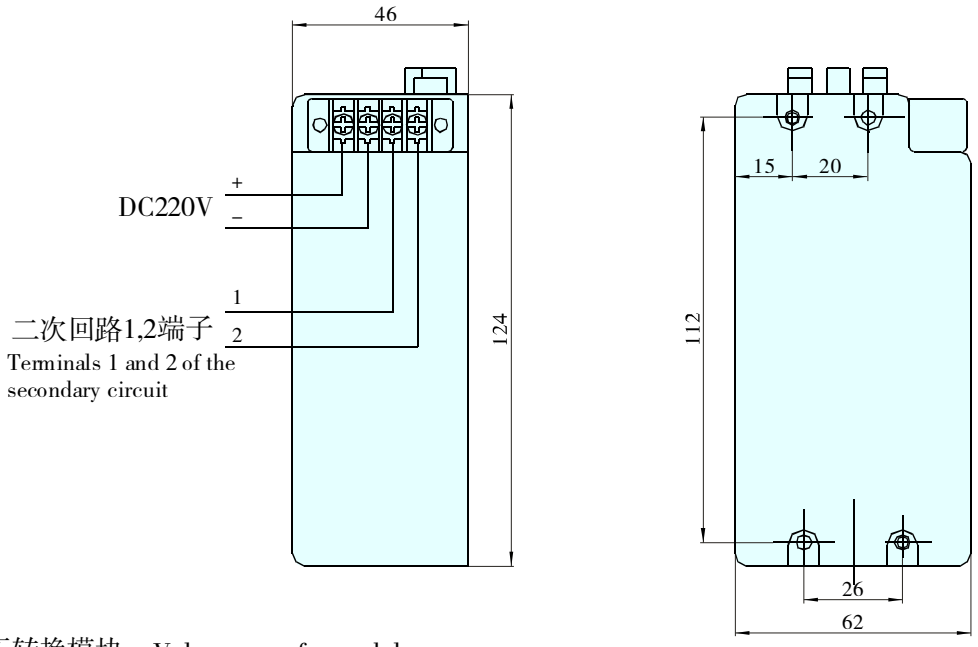
	柜壁 Switchboard wall	带电部分 Live part
d1(注note)(mm)	0	60
d2(mm)	0	60

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.

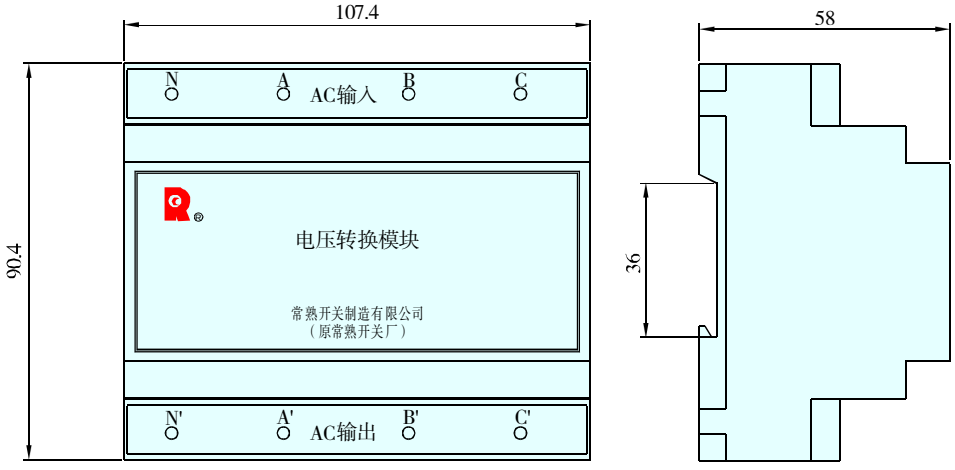
- DC24V专用电源模块 Power supply module



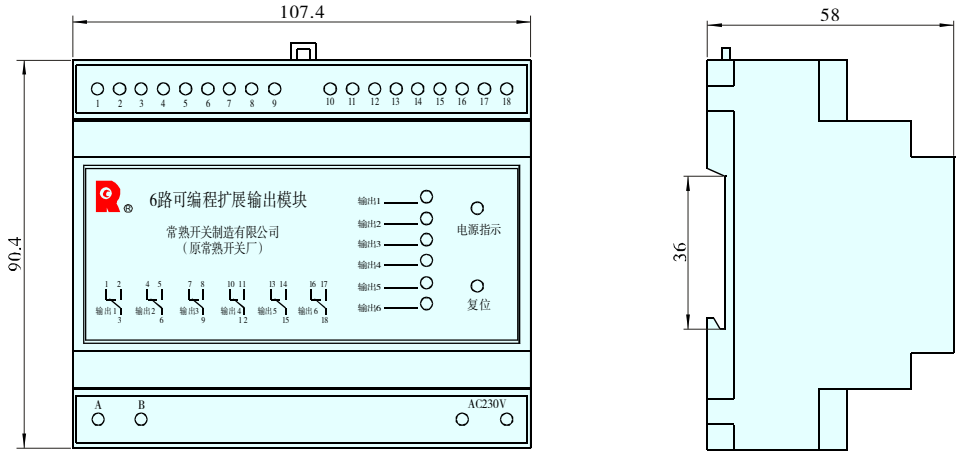
- 直流电源模块：DC power module



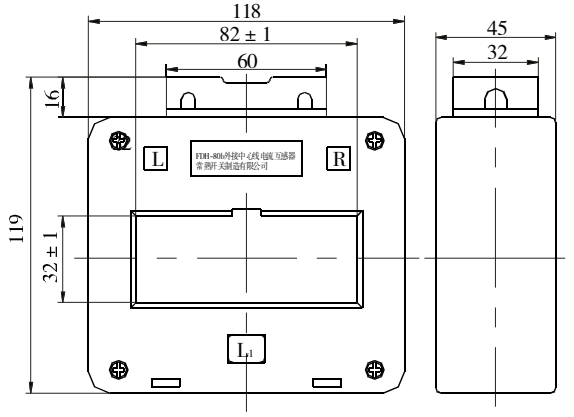
- 电压转换模块：Voltage transfer module

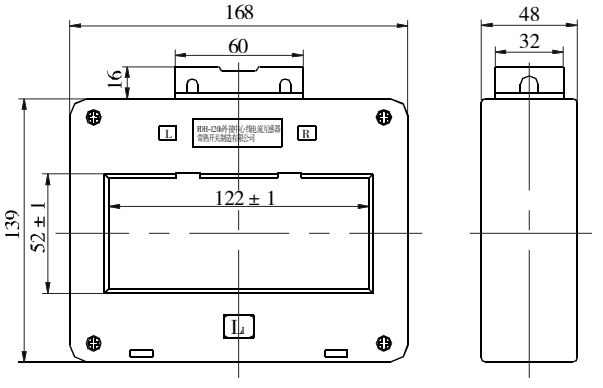


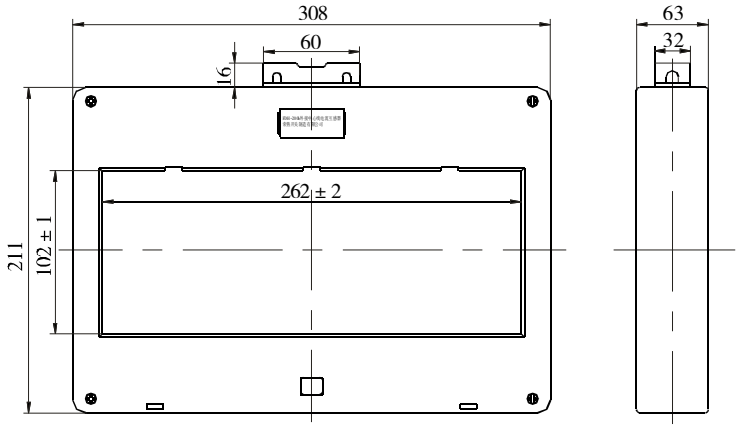
- 可编程扩展输出模块 Programmable output expansion module



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

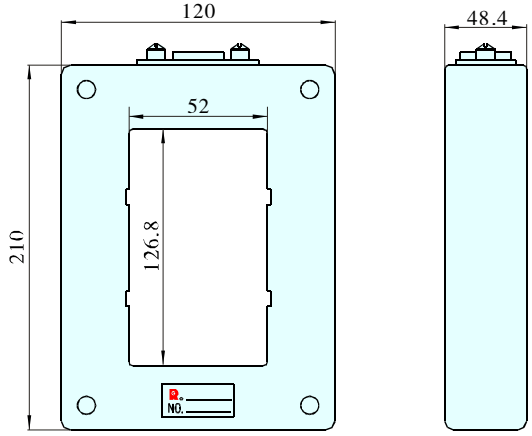




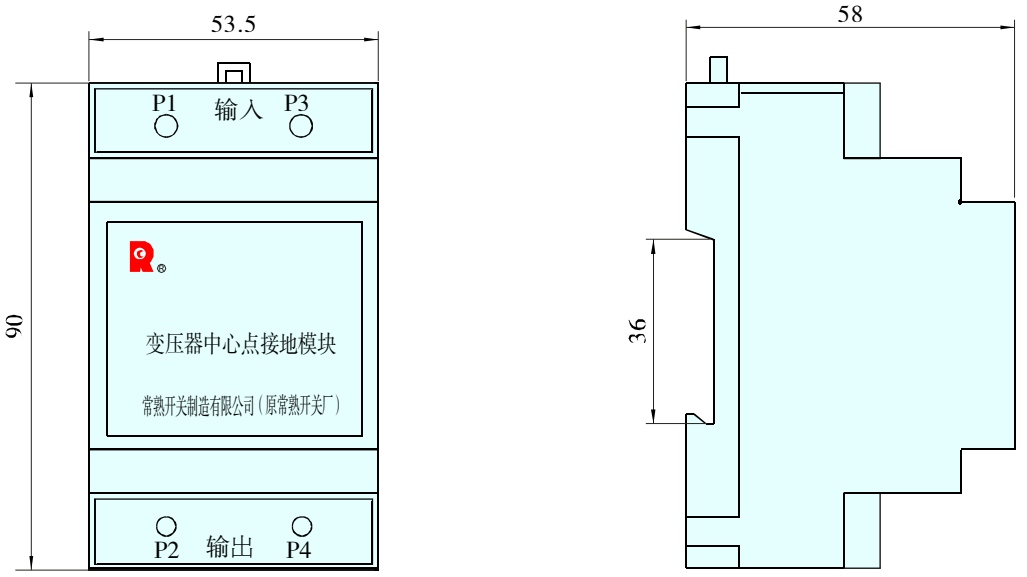


CW3V-3200三极断路器用户可根据N极母线大小选择中性极互感器FDH-120或FDH-260。

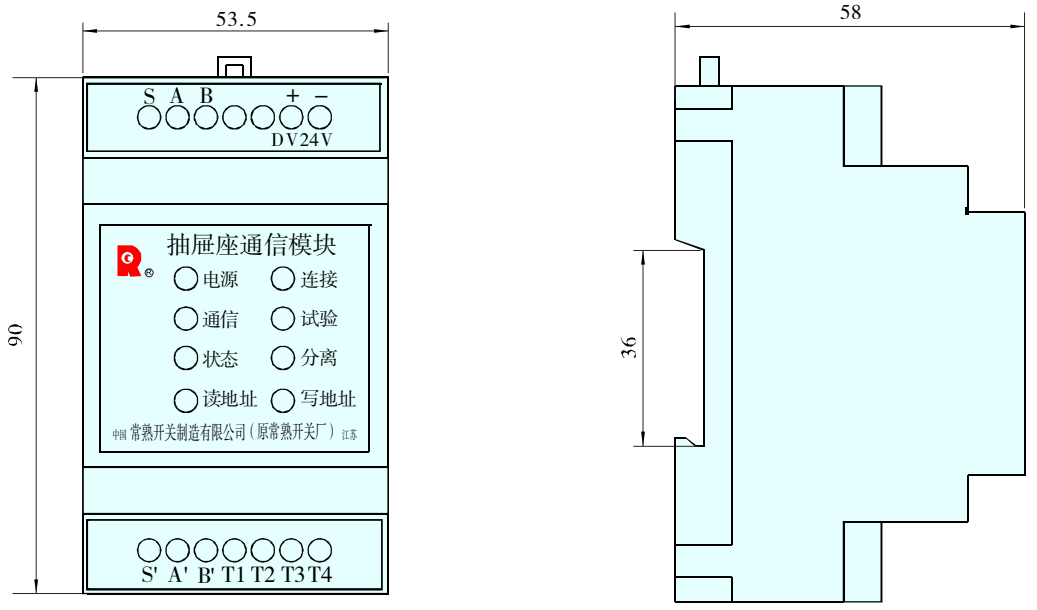
- 变压器中心点接地电流互感器 Earth transformer with transformer's center



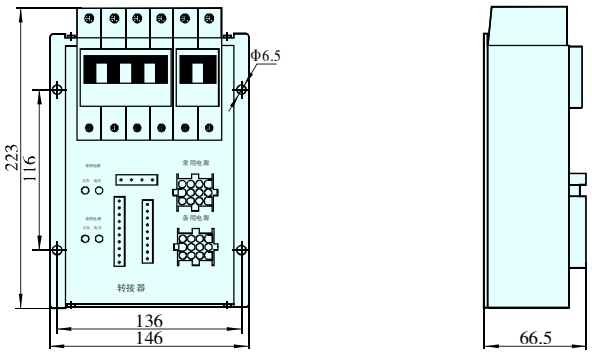
- 变压器中心点接地模块 Earth module of transformer's center



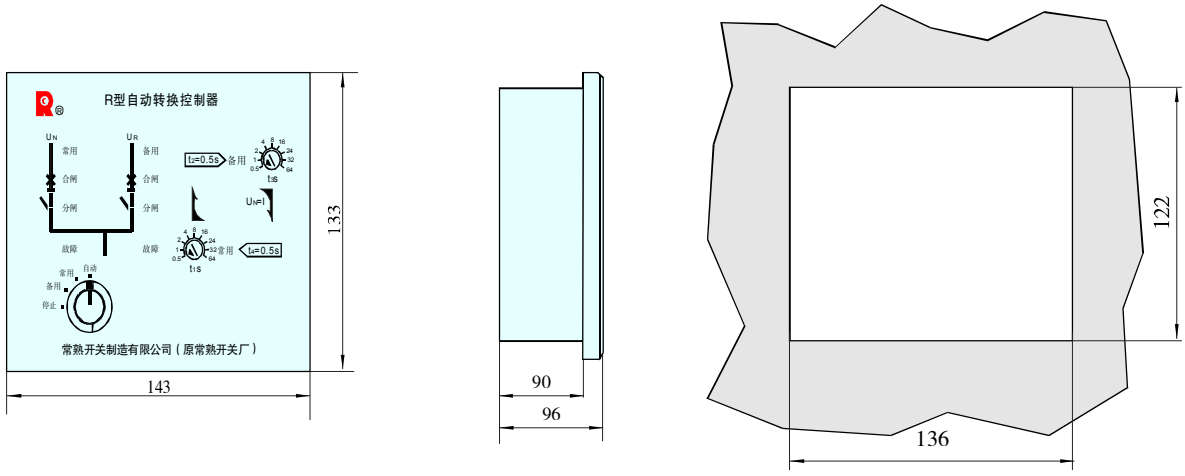
- 抽屉座通信模块 Draw-out socket communication module



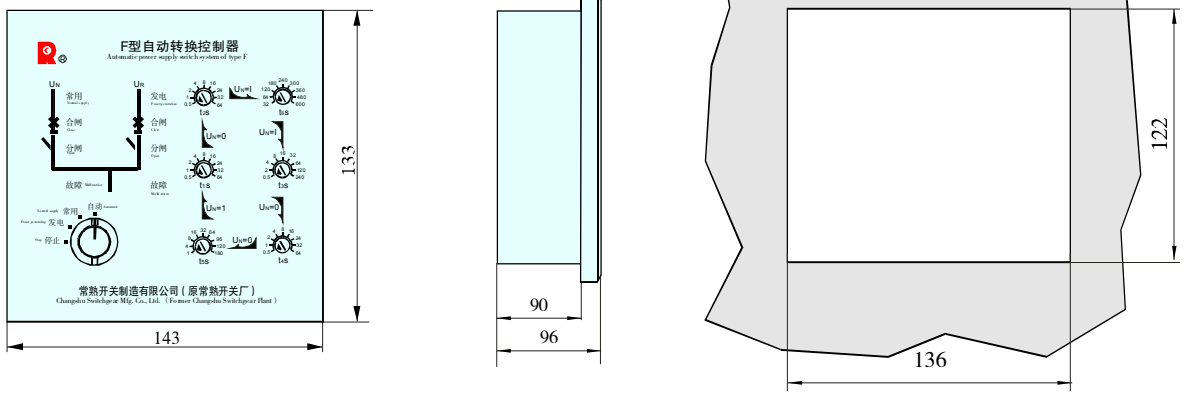
- 转接器 The switching unit



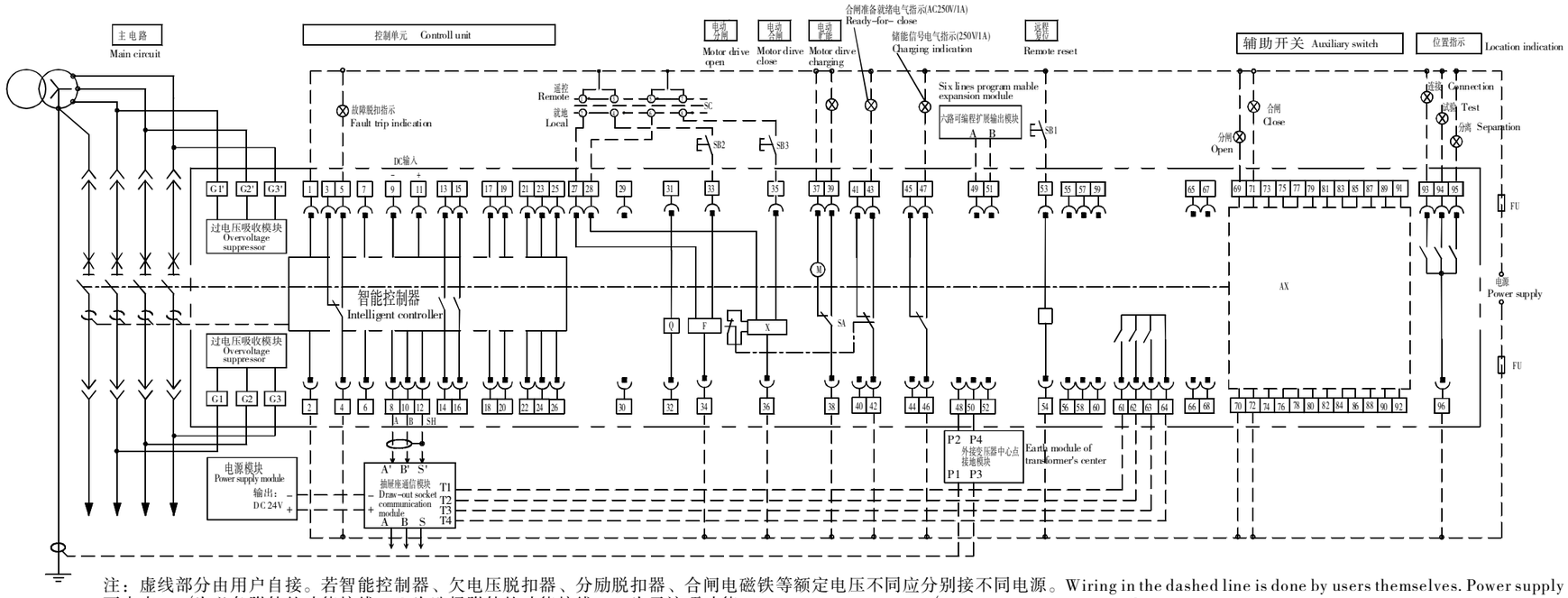
- R、S型自动转换控制器 Automatic power supply switch system of type R and S



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



CW3V-2000/3200二次回路接线图
Wiring diagram of the secondary circuit of CW3V-2000/3200

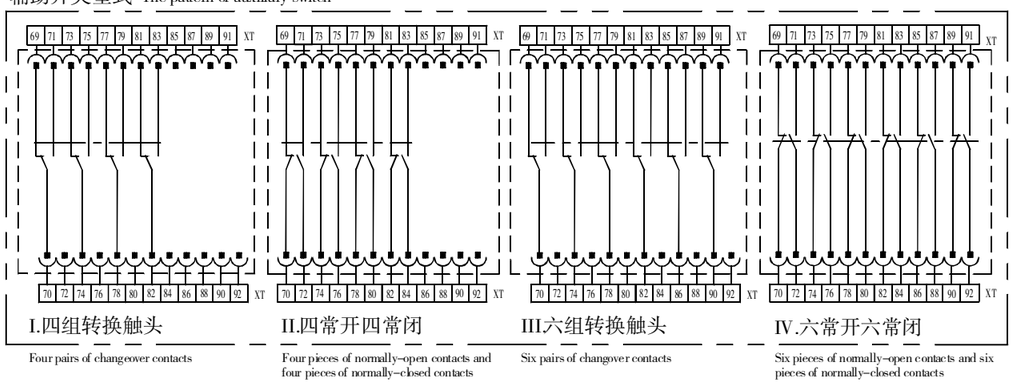


SB1	远程复位按钮	Remote reset button
SB2	分励按钮	Shunt button
SB3	合闸按钮	Closing button
SC	转换开关	chang-over switch
Q	欠电压脱扣器或欠电压延时脱扣器	Under-voltage release
F	分励脱扣器	Shunt release
X	合闸电磁铁	Closing electromagnet
M	贮能电机	Charging motor
SA	电动机行程开关	Limit switch
XT	断路器两次回路接线端子	Terminals
FU	熔断器	Fuse
AX	断路器辅助开关	Auxiliary switch

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.

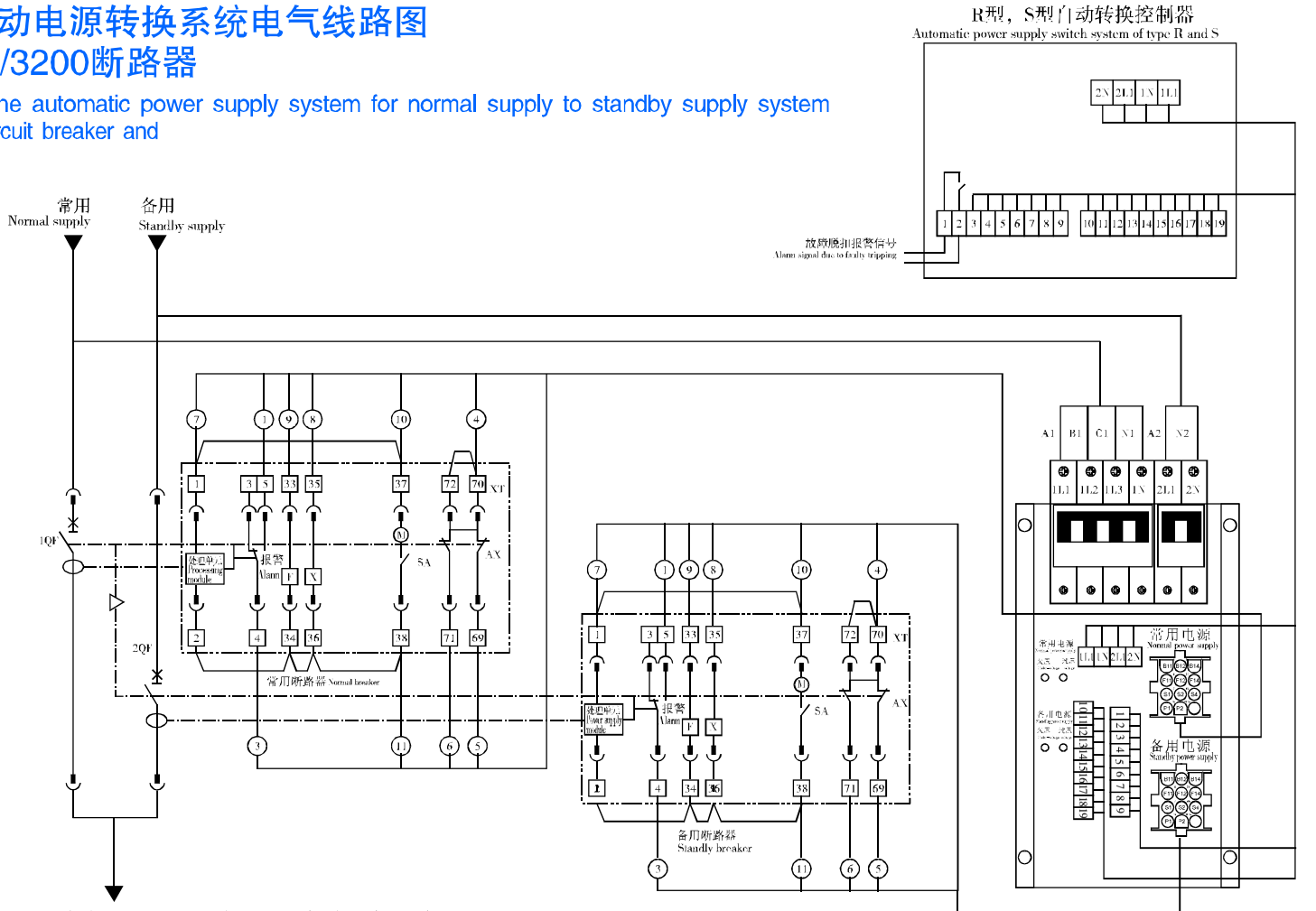
辅助开关型式 The pattern of auxiliary switch



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. A/B is RS485 interface, 8 to A, 10 toB, 12 to SH	○	○	○	○	○
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'	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 simultaneoisly (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 communic ation 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	○	○	○	○	○

常用–备用自动电源转换系统电气线路图
CW3V–2000/3200断路器

Wiring diagram of the automatic power supply system for normal supply to standby supply system CW3V–2000/3200 circuit breaker and



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

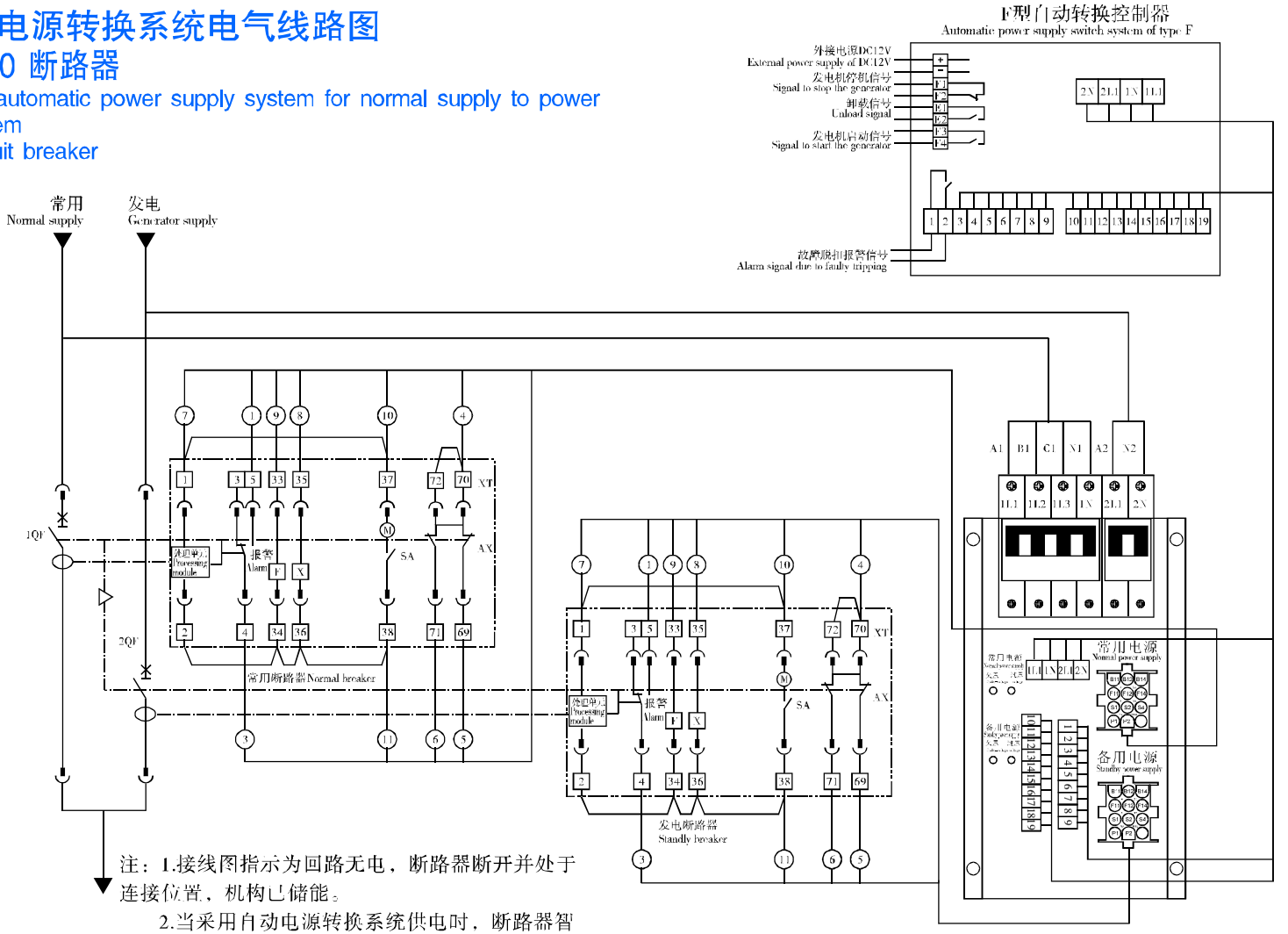
AX – Auxiliary switch
F – Shunt release
X – The electro–magnet to close the breaker
M – Charging motor
SA – Travel–limit switch for the charging motor of the breaker
XT – Terminals for the secondary circuit of the breaker

常用–发电自动电源转换系统电气线路图

CW3V–2000/3200 断路器

Wiring diagram of the automatic power supply system for normal supply to power generating supply system

CW3V–2000/3200 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
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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

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- _____				
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				
基本功能	接地保护 注 Ir4_____A t4_____s (仅36型需填)				
基本功能	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)				
基本功能	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				
选择功能	□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				
选择功能	□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				
选择功能	□通信功能	通信协议选择	标准型式 □Modbus		
			特殊型式 □Profibus □Devicenet □CAN		
选择功能	□ 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
附件配置	FHD 合闸电磁铁	□AC230V	□AC400V	□DC220V	□DC110V
附件配置	FDC 电动操作机构	□AC230V	□AC400V	□DC220V	□DC110V
附件配置	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
附件配置	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		
选择附件		□瞬时型	延时型 □0.5s □1s □2s □3s		
选择附件	□FFS分闸锁定装置	□一锁一钥匙	□二锁一钥匙	□三锁二钥匙	
选择附件	□FLS机械联锁	二台断路器	□钢缆联锁	□联杆联锁（上下联锁）	
选择附件		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
选择附件	□FAN按钮锁定装置	□FXG相间隔板	□FJS计数器		
选择附件	□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				
选择附件	□FFJ附件监测单元	□FBM外接变压器中心点接地单元			
选择附件	□外接中性线电流互感器	□FDH-80	□FDH-120	□FDH-260	
选择附件	□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		
选择附件	□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4编号 ____类型 ____时间 ____ s	输出2 ____ ____ ____ s 输出5 ____ ____ ____ s	输出3 ____ ____ ____ s 输出6 ____ ____ ____ s	
选择附件	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）				
选择附件	□FQY专用电源模块	□DC24V			
选择附件	□FQY/WT直流电源模块	□DC110V	□DC220V		
选择附件	□FZZ自动电源转换系统	自动转换控制器 □R型	□S型	□F型	

注：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）。

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-_____				
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
	□通信功能	通信协议选择	标准型式 □Modbus		
			特殊型式 □Profibus	□ Devicenet	□CAN
	□ 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自动电源转换系统	自动转换控制器	□R型	□S型	□F型

注：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）。

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- _____				
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
□通信功能	通信协议选择	标准型式 □Modbus					
		特殊型式 □Profibus	□Devicenet	□CAN			
□ 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自动电源转换系统	自动转换控制器	□R型	□S型	□F型			

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-_____

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

□通信功能　通信协议选择　标准型式　□Modbus

特殊型式　□Profibus　□Devicenet　□CAN

□ 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自动电源转换系统　自动转换控制器　□R型　□S型　□F型

注：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）。

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-_____

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-_____				
Rated voltage	In =_____A	Rated current	□AC400V □AC690V □AC1140V		
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 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)

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 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– _____				
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 □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 Ir4 ____ A t4 _____ 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 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 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-_____				
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				
	□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.

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。

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}	接地脱扣报警 Earth 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	$\overline{I}_1max$	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	$\overline{I}_2max$	最大需用电流动作报警 Maximum demand current operating alarm		
O	$\overline{I}_3max$	最大需用电流动作报警 Maximum demand current operating alarm		
P	$\overline{I}_nmax$	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 Output number	输出类型 Output type	时间延时触头延时时间 delay time of time delay contact	备注 Remarks
见编号定义表 A ~ W See the number definition table	a,非闭锁触头 non-interlocking contact b,闭锁触头 Interlocking contact c,时间延时触头 Time delay contact	1 ~ 360s	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） 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 Setting value	备注 Remarks
长延时保护 Long-time delay protection	保护曲线类型 Curve types	I^2t	It	I^4t	I^2t	EG型仅有I^2t Only I^2t for type EG
	整定电流Ir1 Setting value of current	0.4 ~ 1In			In	EN、EA、EP、EQ型 For type EN、EA, EP, EQ
		0.4 ~ 1.15In				EG型 For type EG
	整定时间t1 Setting value of time	15 ~ 480s	10 ~ 120s	60 ~ 1440s	480s	EN、EA、EP、EQ型 For type EN、EA, EP, EQ
		15 ~ 60s			60s	EG型 for type EG
短延时保护 Short-time delay protection	整定电流Ir2 Setting value of current	CW3V-2000：(0.4 ~ 15)In+OFF CW3V-3200：（0.4~10）In+OFF			6Ir1	EN、EA、EP、EQ型 For type EN、EA, EP, EQ
		(0.4 ~ 5)In+OFF			3Ir1	EG型 For type EG
	整定时间t2 Setting value of time	0.1 ~ 0.4s（定时限或反时限+定时限） definite time or definite and inverse time			0.2s/反时限+定时限 definite and inverse time	EG型为定时限 inverse time
瞬时保护 Instantaneous protection	整定电流Ir3 Setting value of current	CW3V-2000	(2 ~ 40) kA+OFF		In≤1000A：15In In = 1250A、1600：12In In≥2000A：10In	
		CW3V-3200	(4 ~ 50) kA+OFF			
接地保护 Earth-fault protection	整定电流Ir4 Setting value of current	<1250A	(0.4 ~ 0.8)In		最大 Maximum	
		≥1250A	500 ~ 1200A			
	整定时间t4 Setting value of time	0.1 ~ 0.4s+OFF			0.4s/定时限 inverse time	
中性极保护 Neutral protection	电流整定值 Current setting value	OFF – N/2 – N–N × 2			OFF	三极断路器 Three-pole circuit breaker 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 ~ 690V	265V	
	动作延时 Operating delay	1 ~ 30s	5s	
	返回阈值 Return threshold	动作阈值 ~ 690V Operating threshold ~ 690V	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 ~ 1000V	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	0.2～1I_{r1}	1I_{r1}	
	动作延时 Operating delay	20%～80%t_1	80%t_1	
	返回阈值 Return threshold	0.2I_{r1}～动作阈值 0.2In ~ Operating threshold	0.5I_{r1}	
	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.

<table>
<tr><td rowspan="3">输出编号
Output number</td><td rowspan="3">A ~ W</td><td>出厂设定
Setting value</td><td>备　注　Remarks</td></tr>
<tr><td>Bc1,Cc1</td><td>2路可编程输出模块（内置）
2 lines programmable output module (internal connected)</td></tr>
<tr><td>Aa ,Bc1,Cc1 ,Da, Ea, Fa</td><td>6路可编程扩展输出模块（外置）
6 lines programmable output expansion module (external connected)</td></tr>
<tr><td>输出类型
Output type</td><td>a. 非闭锁触头
Non-interlocking contact
b. 闭锁触头
Interlocking contact
c. 时间延时触头
Time delay contact</td><td>a</td><td rowspan="2"></td></tr>
<tr><td>时间延时触头
延时时间
delay time of time delay contact</td><td>1 ~ 360s</td><td>1s</td></tr>
</table>

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

天津

天津市强强电器科技有限公司 022-83715527

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

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

浙江

杭州华森电器有限公司 0571-86969090
杭州天源机电设备有限公司 0571-87244850
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

安徽

合肥皖为电气设备工程有限责任公司 0551-2884402

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
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
苏州市机电设备有限责任公司 0512-67202006
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
苏州明大机电有限公司 0512-65833162
无锡市法德兰电器成套公司 0510-82736734
盐城市科宇电气有限公司 0515-89800508
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
南通正源电气有限公司 0513-85030391
扬州通润电气设备有限公司 0514-87895515
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
海安县巨龙工贸有限公司 13328080061

山东

莱芜汇鑫实业有限公司 13863410777
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
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