



■ 概述 Summary

CNKW1 系列智能型万能式断路器（以下简称断路器），是本公司设计，制造的新型断路器之一。适用于交流50Hz，额定工作电压400V，额定工作电流630A~3200A的配电网中，用来分配电能和保护线路及电源设备免受过载、欠电压、短路、单相接地等故障的危害，该断路器具有智能化保护功能，选择性保护精确，能提供供电可靠性，避免不必要的停电。

产品符合GB14048.2《低压开关设备和控制设备低压断路器》、IEC60947-2《低压开关设备和控制设备：断路器》标准。

CNKW1 Series Intelligent Air Circuit Breaker (hereinafter called the circuit breaker) is one of novel circuit breakers designed and made by us.

This circuit breaker is suitable used in the distribution network with rated operational voltage 400V, rated working current 630A~3200A, AC 50Hz, for distributing power and protecting line and power supply facility from damage of many faults such as overload, under voltage, short circuit, single-phase earthing etc., it possess many advantages of intelligent protection functions, precise discrimination protection to provide reliable power supply and avoid unnecessary power cut.

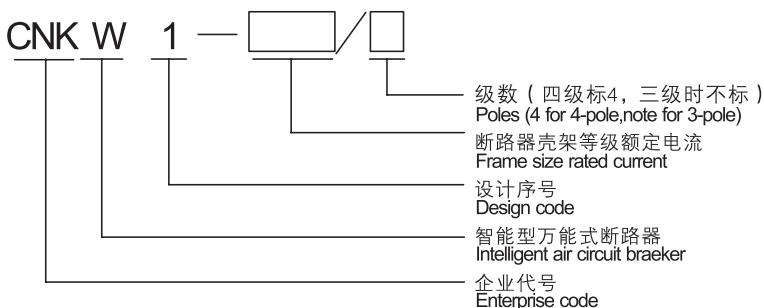
This product meet the requirements of GB 14048.2 “Low-voltage switchgear and controlgear Low-voltage circuit breakers” and IEC 60947-2 “Low-voltage switchgear and controlgear Low-voltage switchgear and controlgear circuit breakers withdrawable circuit-breaker”.

■ 正常工作条件和安装条件 Conditions for normal working and installing

- 周围空气温度上限值不超过+40℃，且24h的平均值不超过+35℃。
周围空气温度下限值不低于—5℃；
- 安装地海拔高度不超过2000m。
- 大气条件
最高温度为+40℃时，空气的相对湿度不超过50%；在较低温度下可以有较高的相对湿度；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：3级；
- 安装类别
断路器用于安装类别IV；辅助电路的安装类别出了欠电压脱扣器线圈，电源变压器初级线圈与断路器主电路相同外，其余为Ⅲ。
- 断路器应按使用说明书进行安装。断路器的垂直倾斜度不超过5°。

- The upper limit of ambient temperature does not exceed +40°C, and the average value within 24 h does not exceed +35°C, the lower limit is not lower than —5°C.
- Altitude of installing place does not exceed 2000m.
- Atmospheric condition:
When the maximum temperature is +40°C, the relative humidity does not exceed 50%; the lower the temperature, the higher the relative humidity, for example at +20°C, the relative humidity may be up to 90%, a special measure may be adopted for occasional condensation.
- Degree of pollution: 3— class.
- Installing category:
Category IV for the circuit breaker, under voltage tripping coil, primary coil of power transformer of secondary circuit; III for others.
- The installation of circuit breaker shall observe the application instruction, the vertical inclination of circuit breaker shall not exceed 5°.

■ 型号及其含义 Model denomination





CNKW1 系列智能型万能式断路器
CNKW1 Series Intelligent Air Circuit Breaker

分 类 Classification

a 按安装方式分：固定式、抽屉式。
Per installing mode: fixed, withdrawable circuit-breaker

b 按操作方式分：电动操作、手动操作。
Per operating mode: motorized, manual

c 脱扣器种类：智能型过电流脱扣器、欠电压瞬时（或延时）脱扣器、分励脱扣器。
Kind of release: intelligent over current release, under voltage instantaneous (delay) release, shunt release.

d 极数：三极、四极。
Poles: 3-pole, 4-pole.

■ 主要参数及技术性能 Main parameters and technical performance

断路器基本参数见表1

The circuit breaker's basic parameters are shown in table 1:

表1 断路器的基本参数

Table 1: The basic parameters of circuit breaker

型号 Type		CNKW1—2000	CNKW1—3200
壳架等级额定电流Inm Frame size rated current	A	2000框 I (Frame I)	3200框 II (Frame II)
额定绝缘电压Ui Rated insulation voltage Ui	V		1000
额定工作电压Ue Rated working voltage	V		400
额定电流In Rated current	A	630、800、1000、1250、1600、2000	2000、2500、(2900)、3200
额定极限短路分断能力Icu Rated ultimate short-circuit breaking capacity	kA	80	100
额定运行短路分断能力Ics Rated service short-circuit breaking capacity	kA	50	65
额定短时耐受电流 (1s Icw Rated short-time withstand current	kA	40][1s,延时(delay)0.4s分断(breaking)]	65(1s, 延时0.4s分断)

注：断路器飞弧距离为“0”

断路器电流——温度系数

Circuit breaker current-Temperature coefficient

环境温度Ambient temperature		+40°C	+45°C	+50°C	+55°C	+60°C
允许持续工作电流 A	2000	1In	0.95In	0.9In	0.85In	0.8In
Permissible continuous operational current	3200	1In	0.92In	0.86In	0.8In	0.74In

智能型过电流脱扣器的功能

Function of intelligent over current release

1. 过电流脱扣器的保护特性

Protective characteristic of over current release

a. 脱扣器的整定值Ir(I/ln)及误差见表2

Setting value of release Ir(I/ln) and error are show in table 2

表2 脱扣整定值及误差

Table 2: trip setting and error

长延时Long delay		短延时Short delay		瞬时Instantaneous		接地故障Earthing fault	
Ir1	误差	Ir2	误差Error	Ir3	误差	Ir4	误差
(0.4~1.0)In (最小Min 160A)	± 15%	(0.4~15)In	± 10%	In~50KA(Inm=2000A) In~75KA(Inm=3200A)	± 15%	框1(Frame1): (0.2~0.8)In最大(Max)1200A取小值(Min), 最小(Min)160A取大值(take small value) 框11(Frame11): (0.2~0.6)In或1600A取小值	± 10%

注：当同时具有（要求）三段保护时，整定值不能交叉。

Note: When the three-section protections are requested at the same time, the crossover of setting values is not allowable.

b. 长延时对电流保护反时限动作特性 $I^2T_L = (1.5In)^2t_L$, 其 (1.05~2.0) Ir 的动作时间见表3。其时限误差为 ± 15%。
注：tL—长延时1.5Ir1的整定时间，TL—长延时的动作时间。

The inverse time-delay operating characteristics of long delay over current protection $I^2T_L = (1.5In)^2t_L$, the operating time of (1.05~2.0) Ir see table 3. Its time error is ± 15%.



表3 过电流脱口长延时特性

Table 3: Long delay characteristic of over current tripping

L/I _{r1}	动作时间 s					
	> 2h不动作 Disable					
1.3	< 1h动作 Active					
1.5	15	30	60	120	240	480
2.0	8.4	16.9	33.7	67.5	135	270

C 短延时过电流保护动作特性。脱扣器过电流脱扣在低倍数电流时为反时限特性，其 $I_{2TL} = (8I_{r1})2ts$, ts为一般延时设计时间，当过载电流 $> 8I_{r1}$ 时，应自动转换为定时限特性，其定时限特性见表4。其误差为 $\pm 15\%$ 。

Operating characteristic of short delay over current protection. The over current trip of the release in low multiple current possess inverse time characteristic, $I_{2TL} = (8I_{r1})2ts$, the ts is common delay design time, when overload current $> 8I_{r1}$, shall switch over as the specified time characteristic, its characteristic may refer to table 4, its error is $\pm 15\%$.

表4 过电流脱扣器短延时特性

Table 5 over current tripping short delay characteristic

延时时间 (Delay time)/s	可返回时间 (Returnable time)/s
0.1 0.2 0.3 0.4	0.06 0.14 0.23 0.35

d 过电流脱扣保护特性见图1，

For the over current tripping protection characteristic, see figure 1

e 接地故障保护特性为定时限，其延时特性见表4，其保护特性见图2。

The earthing fault protection characteristic is the specified time, for the delay characteristic, see table 4, its protection characteristic, see figure 2.

2 . 电流表功能

在液晶显示屏上显示主回路的电流，在按动“选择”键时，显示出指示灯所在相的电流或最大相电流，再按一次“选择”键，则显示另一相电流。

Function of current meter

The main circuit current is displayed on the liquid crystal display screen, when depressing the “SELECT” key, display the phase current or the maximum phase current of the phase showing by indicator, if depressing the “SELECT” key once more, display that of the another phase.

3 . 自诊断功能

a 脱扣器具有本机故障诊断功能。当计算机发生故障时能发出出错“E”显示或报警，同事重新启动计算机，用户需要时，也可将断路器分断。

b 当局部环境温度达到80°C或者由于触头的发热使机壳内温度超过80°C时，能发出报警，并能在较小的电流时（用户需要时）分断断路器。

Function of self-diagnostic

a. The release possesses the local fault diagnostic function. When computer occurs fault, the “E” message is displaying or the alarm is send out, at the same time, restarting the computer, the circuit breaker may be cut off for user's demand.

b. When local environmental temperature reach up to 80°C or temperature in housing exceed 80°C from contact heating, alarming is given out, the circuit breaker may be cut off in lower current for user's demand.

2 . 整定功能

按动“设定”功能键，选择需整定的有关内容，然后按“+”“-”键可以按用户要求任意整定所需的电流和延时时间，在达到所需的电流或延时时间后再按“贮存”键即能符合用户的整定电流及延时动作时间，详见“安装、使用及维护”中脱扣器整定。在过电流故障发生时，能立即停止执行该功能。

Setting function

Press “SET” functional key, select relative content to be set, then press “+” or “-” key to set the needed current and delay time, finally press “STORE” key to obtain the needed setting current and delay operating time, for details, to see the setting of release in “Installation, Usage and Maintenance”. If over current fault occurs, this function may be stopped immediately.



2 电流表功能

在液晶显示屏上显示主回路的电流，在安东“选择”键时，显示出指示灯所在相的电流或最大相电流，再按一次“选择”键，则显示另一相电流。

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5 试验功能

按动“设定”键，使整定值电流到长延时，短延时，瞬时状态，指示灯亮及“+”“—”键，选择所需要的电流值，再按试验键能进行脱扣器试验，试验键有二种：一为“不脱扣”试验键，一为“脱扣”试验键，前一种试验功能可在断路器接于电网中运用时进行，当网络中实际发生过电流时，即可中断试验功能，进行实际的过电流保护。

6 负载监控功能

设置二个整定值，ILC1整定范围（0.2~1）In，ILC2整定范围（0.2~1）In，ILC1延时特性为反时限特性，其延时整定值为长延时整定值的1/2。ILC2的延时特性有二种：第一种为反时限特性，其时间整定值为长延时整定值的1/4；第二种为定时限特性，其延时时间为60s。这两种延时功能前者用于当电流接近过载整定值时分断下级最不重要负载，后者则用于当电流超过ILC1值，使延时分断下级不重要负载后，电流下降，使主电路和重要负荷电路保持供电，当电流下降到ILC2时经一段延时后发出指令，再接通下级已切除过的电路，回复整个系统的供电。负载监控特性（见图3、图4）。

7 脱扣器的显示功能

脱扣器能在运行时显示其运行电流（即电流表功能），故障发生时显示其保护特性规定的区段并在分断电路后锁存故障显示及故障电流，在整定时显示整定区段的电流，时间及区段类别，如是延时动作，在动作过程中指示灯闪烁，断路器分段后指示灯由闪烁转为恒定发光。试验时显示试验电流、延时时间、试验指示及试验动作区段。

Function of current meter

The main circuit current is displayed on the liquid crystal display screen, when depressing the “SELECT” key, display the phase current or the maximum phase current of the phase showing by indicator, if depressing the “SELECT” key once more, display that of the another phase.

Function of self-diagnostic

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Setting function

Press “SET” functional key, select relative content to be set, then press “+” or “—” key to set the needed current and delay time, finally press “STORE” key to obtain the needed setting current and delay operating time, for details, to see the setting of release in “Installation, Usage and Maintenance”. If over current fault occurs, this function may be stopped immediately.

Test function

Press “SET” functional key, enable setting current to long delay, short delay, instantaneous state, the indicator lights, press “+” or “—” key to select the needed current, then press “TEST” key to carry out the release test. There are two “TEST” keys, one for “non-tripping”, another for “tripping”, the former test function may be carried occurs actually, the test function is interrupted, to carry out actual over current protection.

Load monitoring function

There are two setting values, ILC1(0.2~1)In setting range, ILC2(0.2~1)In setting range, ILC1 delay characteristic is inverse time characteristic, its delay setting value is 1/2 of long delay setting value. ILC2 with two delay characteristics, one is inverse time characteristic, its time setting value is 1/4 of long delay setting value; another is the specified time characteristic, its lag time is 60s. The former function is used for breaking the lower stream load with the least of importance, while current approach to the over load setting value, the latter function is used for : when the current exceed ILC1 value, after breaking the lower stream load with the least of importance, to keep power supply of the main circuit and the important load circuit, when the current reduce down to ILC2 and after specified lag time, the command send out the to close the opened lower stream circuit again to restore the power supply of whole system. Load monitoring characteristic (see figure 3, figure 4).

Display function of release

When running, the release display the running current (i.e. current meter function), when the fault occur, display the specified section of protection characteristic and after breaking circuit, latch the fault display and fault current, when setting, display the current of setting section, time and section, time and section category, for delay operating, during operating process, the indicator is flashing, after the breaker cut off, the indicator change from flashing to constant lighting. When testing, display testing current, delay time, test display and test operating section.

Operating performance of circuit breaker

The operating performance of circuit breaker is shown by operating cycle times as in table 6.



CNKW1 系列智能型万能式断路器
CNKW1 Series Intelligent Air Circuit Breaker

表6 断路器操作性能

Table 6 Operating performance of circuit breaker

壳架等级额定电流Inm A Frame size rated current	每小时操作循环次数 Operating cycle times per hour	不通电 次数 Times for power off	通电 次数 Times for power on	总次数 Total times
2000	20	2500	500	3000
3200	10	1500	500	2000

断路器的内部附件工作电压及所需功率见表7

Operational voltage and needed power of accessory in circuit breaker are shown in table 7:

表7 断路器的内部附件工作电压及功率

Table 7 Operational voltage and power of accessory in circuit breaker

所需功率 Alternating current	额定工作电压 V Rated operational voltage	交流 (50Hz) Needed power		直流Direct current	
		230	400VA	100	230
分励脱扣器	Shunt release	24VA	36VA		24W
欠电压脱扣器	Under voltage release	24VA	36VA		
操作机构(电动机)	Operating mechanism(motor)2000A/3200A	85VA/110VA	85VA/110VA	85W/110W	85W/110W
释能电磁铁	Discharging electromagnet	24VA	36VA		24W

注：分励脱扣器的可靠动作电压范围为70%~110%，释能电磁铁和操作机构为85%~110%。

Note: For the reliable operating voltage range, the shunt release is 70%~110%, the discharging electromagnet and operating mechanism are 85%~110%.

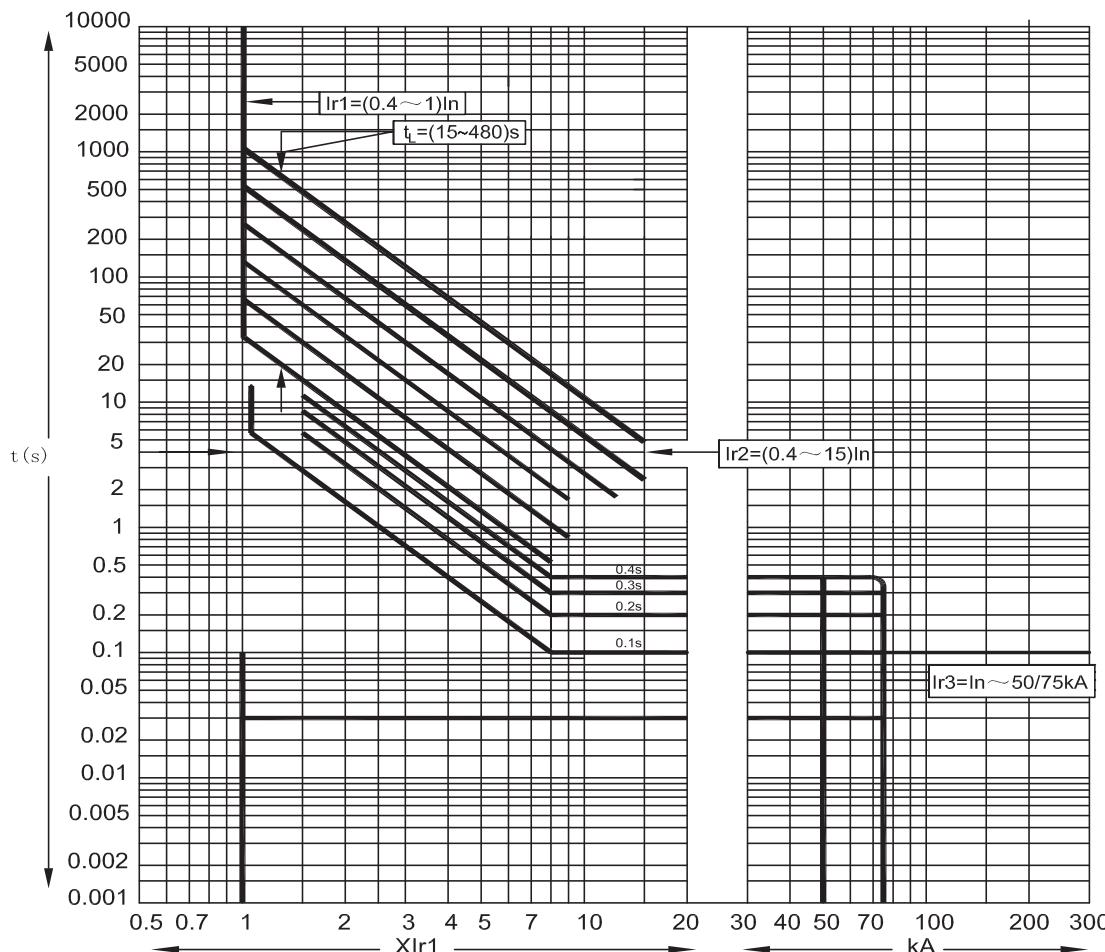


图1 过电流脱扣保护特性



CNKW1 系列智能型万能式断路器

CNKW1 Series Intelligent Air Circuit Breaker

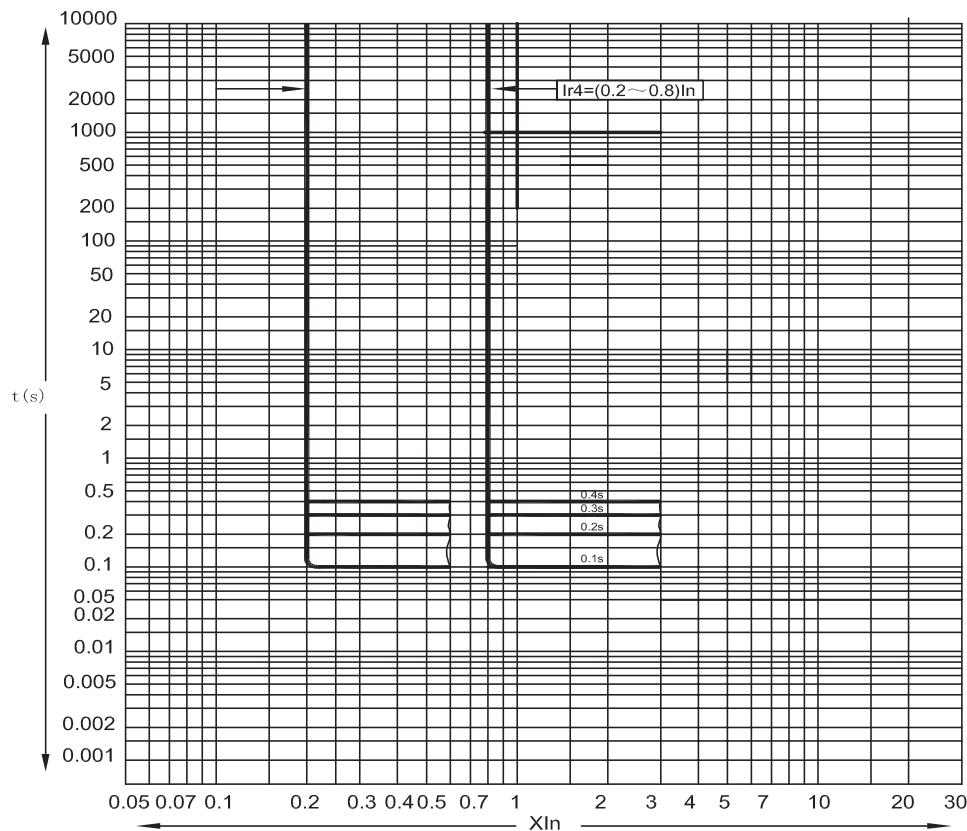


图2 接地故障保护特性

断路器欠电压脱扣器性能见表8

The performance of under voltage release of circuit breaker is shown in table 8

表8 欠电压脱扣器性能

Table 8 Performance of under voltage release of circuit breaker

类别 Category	欠电压延时脱扣器 Under voltage delay release	欠电压瞬时脱扣器 Under voltage instantaneous release
脱扣器动作时间 Release operating time	延时 (Delay) 1、3、5s	瞬时 Instantaneous
脱扣器动作电压值 Release operating voltage value	35%~70%Ue ≤35%Ue ≥85%~110%Ue	能使断路器断开 Enable circuit breaker break off 断路器不能闭合 Enable circuit breaker in non-closing 断路器能可靠闭合 Enable circuit breaker reliable closing
在1/2延时时间内，当电源电压恢复到85Ue时 Within 1/2 delay time, when power voltage restore to 85 Ue	断路器不断开 Enable circuit breaker in non-opening	

注：延时时间准确度为 $\pm 10\%$ 。

Note: accuracy of delay time is $\pm 10\%$.

辅助触头 Auxiliary contacts

1 辅助触头的约定自由空气发热电流为6A。

The conventional free air thermal current of auxiliary contact is 6A.

2 辅助触头形式：四常开四常闭。在断路器接触组引出时连接四组转换触头。

Mode of auxiliary contact: 4 NO 4 NC. Four groups change-over contacts were connected, while leading the contact group of circuit breaker.

3 辅助触头的非正常接通及分断能力见表9。

The abnormal closing and breaking capacity of the auxiliary contacts are shown in table 9.

4 辅助触头正常条件下的接通与分断能力见表10

The normal closing and breaking capacity of the auxiliary contacts are shown in table 10.



{ CNKW1 系列智能型万能式断路器 }
CNKW1 Series Intelligent Air Circuit Breaker

表9 辅助触头的非正常接通及分断能力

Table 9 Abnormal closing and breaking capacity of the auxiliary contacts

电流种类 Kind of current	使用类别 Utilization category	额定控制容量 Rated control capacity(Pe)	额定工作电压 Rated operational voltage(Ue)	接通与分断能力 Closing and breaking capacity					通断操作循环次数和操作频率 Switching operation cycle times and operation frequency		
				U/Ue	I/Ie	cos ϕ	T _{0.95} (ms)	操作循环次数 Operational cycle times	每分钟操作循环次数 Operation cycle times per minute	通电时间(s) Power on time(s)	
交流 AC	AC-15	300VA	400V	1.1	10	0.3	—	10	6(或与主回路操作频率相同) 6(Or identical with main circuit operation frequency)	0.05	
直流DC	DC-13	60W	230V	1.1	1.1	—	300				

表10 辅助触头正常接通及分断能力

Table 10 Normal closing and breaking capacity of the auxiliary contacts

电流种类 Kind of current	使用类别 Utilization category	额定控制容量 Rated control capacity (Pe)	额定工作电压 Rated operational voltage (Ue)	接通 Closing				分断 Breaking			
				U/Ue	I/Ie	cos ϕ	T _{0.95} (ms)	U/Ue	I/Ie	cos ϕ	T _{0.95} (ms)
交流 AC	AC-15	300VA	400V	1	10	0.3	—	1	10	0.3	—
直流DC	DC-13	60W	230V	1	1	—	300	1	1	—	300

表6 断路器操作性能

Table 6 Operating performance of circuit breaker

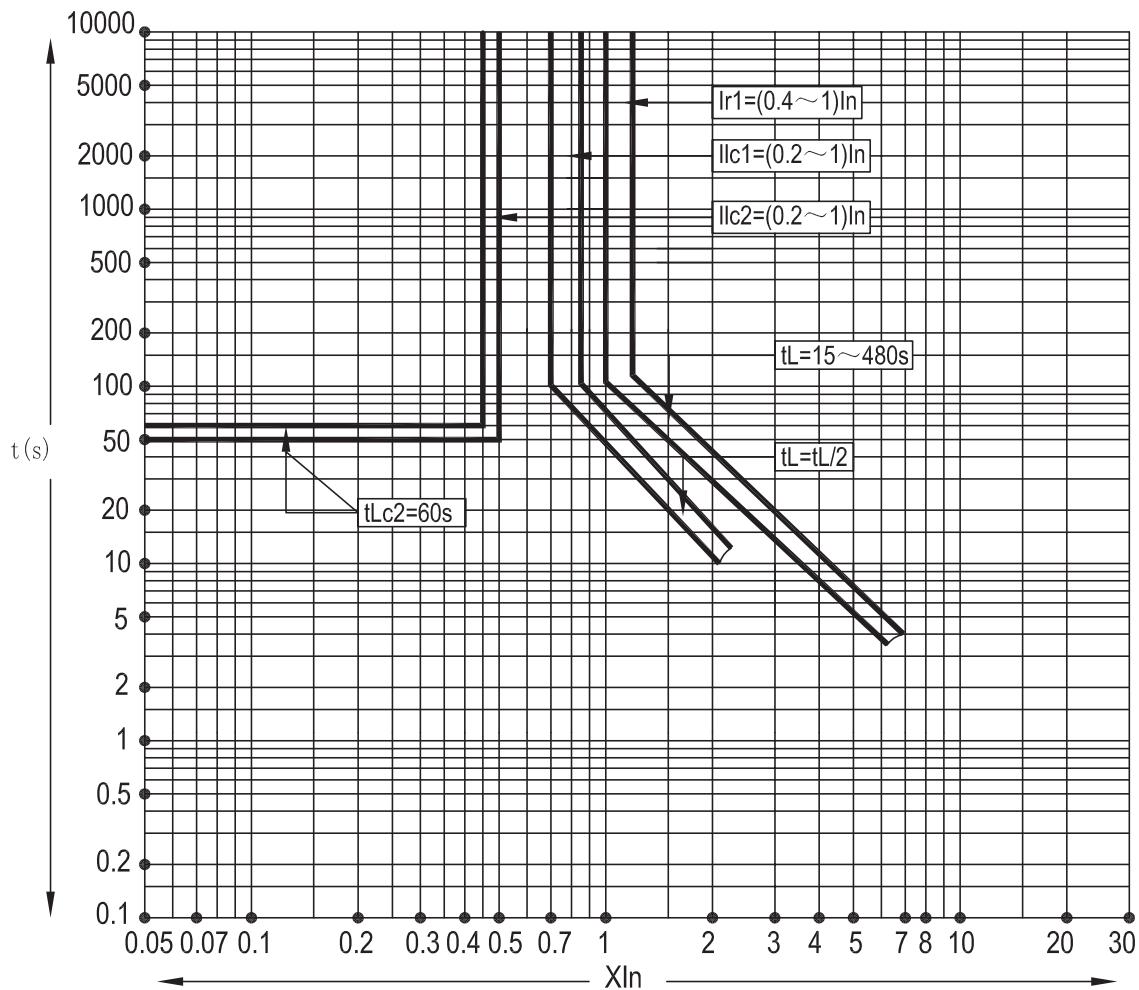
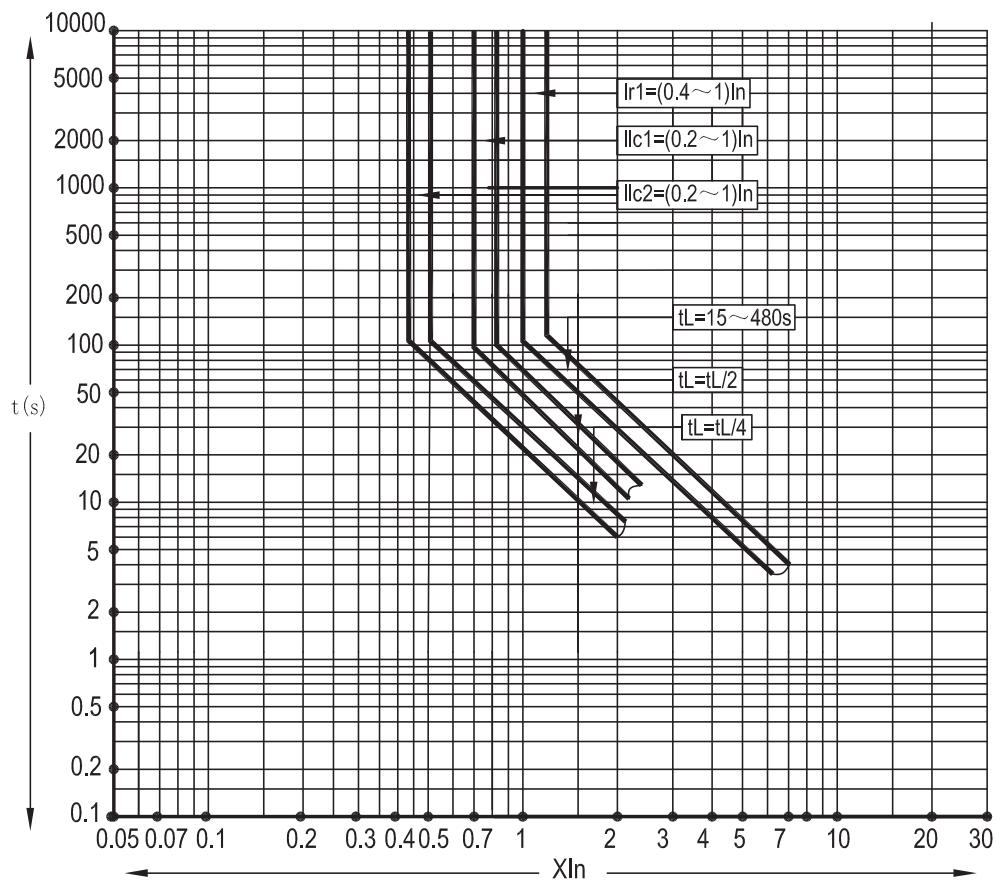


图3 负载监控特性



CNKW1 系列智能型万能式断路器

CNKW1 Series Intelligent Air Circuit Breaker



结构说明 Structure specification

欠压脱扣器 Under voltage release
闭合电磁铁 Closing electromagnet
分励脱扣器 Shunt release
灭弧室 Arc chute

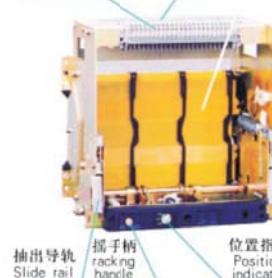


5-1
分闸按钮 OFF pushbutton
智能型脱扣器 Intelligent release
合闸按钮 ON pushbutton
电动储能机构 Motorized charging mechanism

辅助触头
手柄 handle (手动储能)
(i) 用于固定板式
(For the fixed plate)

主触头位置指示 Position indicator of main contact
机构储能状态指示 State indicator for energy storing

铭牌 Nameplate
二次接线端 Secondary connection terminal
罩壳 Shell
隔离板 Isolating plate



5-3

5-2

断路器有固定式和抽屉式之分，把固定式断路器本体装入专用的抽屉座就成为抽屉式断路器。断路器本体由触头系统、灭弧系统、操动机构、电流互感器、智能型脱扣器、辅助触头、二次插接件、欠电压脱扣器和分励脱扣器等部件组成；抽屉座由带导轨的左右侧板、底座和横梁等组成。触头系统封闭在绝缘底板内，且每相触头也都由绝缘板隔开，形成一个个小室，而智能型脱扣器、手动操作机构、电动操作机构依次排在其前面形成各自独立的单元，如其中某一单元坏了，可将其整个拆下换上新的。断路器结构见图5-1、5-2、5-3。

The circuit breaker may be divided into the fixed and the drawout , if mounting the body of the fixed into the drawout cassettes, it become the drawout circuit breaker. The circuit breaker body consists of contact system, arc extinguishing system, operating mechanism, current transformer, intelligent release, auxiliary contact, secondary plug-in part, under voltage release and shunt release etc.; the drawout cassettes consists of the left side plate and right side plate with slide rail, base and crossbar etc. The contact system is enclosed in the insulating baseplate, contacts for each phase is isolated by insulating plate to form compartments.

The intelligent release, manual operating mechanism, motorized operating mechanism is arranged on the font one by one to form independent unit, if any one unit is damaged, replace the whole unit with a new unit. For construction of the circuit breaker, refer to figure 5-1, 5-2, 5-3.



{ CNKW1 系列智能型万能式断路器 }

CNKW1 Series Intelligent Air Circuit Breaker

触头系统 Contact system

每相触头系统被安装在由绝缘构成的小室内，其上方是灭弧室。触头系统由连杆与绝缘板外的主轴连接，从而完成闭合、分断的任务。而每相触头系统为了降低电动斥力及提高接触可靠性采用10档触头并联形式，安装在一个触头支持上。触头接触片的一端由软联结与母排连接。断路器在闭合时，主轴带动连杆使触头支持绕旋转轴作逆时针转，当动触头与静触头接触后绕轴作顺时针转到，压缩弹簧，从而产生一定的触头压力，确保断路器可靠闭合。

The contact system for each phase is built-in the insulation compartment, with the arc chute over it. The contact system is connected with the shaft outside insulation plate via link gear to complete closing, opening. To reduce electro-dynamic repulsion force and upgrade contact reliability, the contact system of each phase support. One end of contact piece is connected with busbar via flexible connection. When closing, the shaft of circuit breaker bring the link gear to enable the contact support rotating around rotary hub anti-clockwise, after connecting with the stationary contact, the moving contact rotating around rotary hub clockwise, compressing the spring, produce specified pressure force, to ensure closing circuit breaker reliably.

操作机构 Operating mechanism

本断路器操作方式有手动和电动两种，断路器采用弹簧储能闭合（有预储能），闭合速度与电动或手动操作速度无关。

断路器利用凸轮压缩一组弹簧达到储能目的，并具有自由脱扣功能。断路器有三种操作位置。

电动操作机构由电机、限位微动开关及带行星齿轮的一组齿轮减速系统所构成，用于断路器的预储能。

This circuit breaker possesses two operation modes of manual and motorized, adopt closing with charged spring (pre-storing energy), its closing speed is independent with the motorized operating speed or the manual operating speed.

The circuit breaker uses the cam to compress one group of spring to store energy, with free tripping function. The circuit breaker possesses three operation positions.

The motorized operating mechanism consists of motor, limit cell switch and planet gear speed reducing system for pre-storing energy.

智能型脱扣器 Intelligent release

脱扣器的构成可用下述关系图表示（见图6）

Release construction may be shown as below relationship charts (see figure 6)

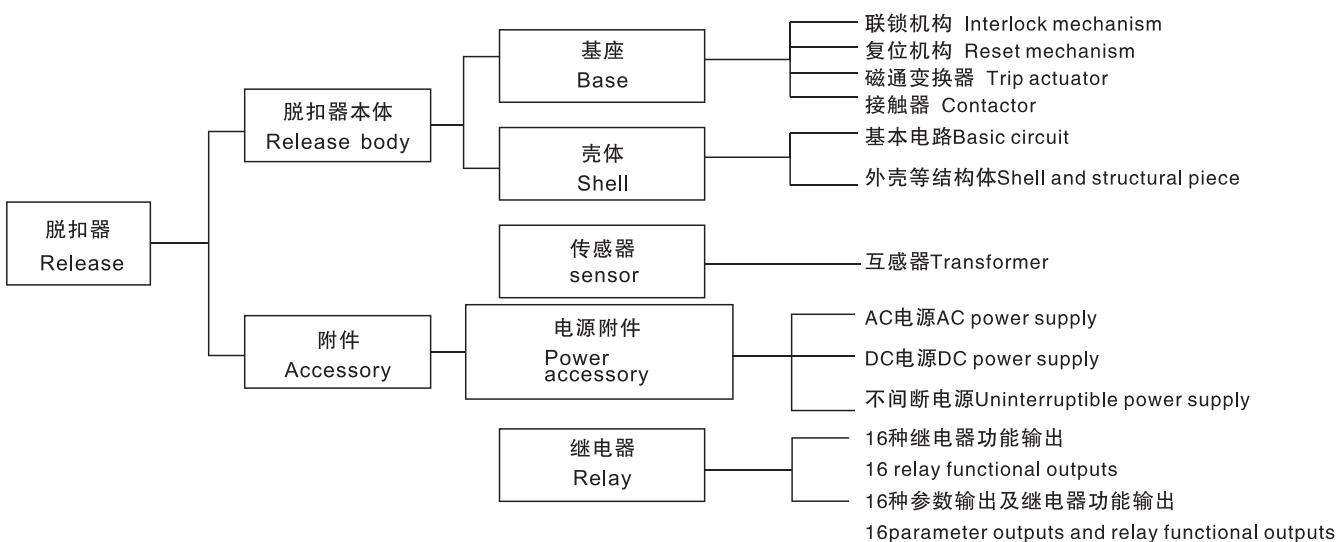


图6 脱扣器构成关系图
Figure 6 Relationship charts of release construction



抽屉式断路器组成

Construction of draw cut circuit breaker

抽屉式断路器由断路器本体与抽屉座组成，抽屉座内的导轨能自由进出，断路器本体座落于这一导轨上进出抽屉，通过短路提本体上的母线与抽屉座上的桥式触头的插入联结接通主回路。

抽屉式断路器有三个工作位置：“接通”位置，“试验”位置，“断开”位置。位置变更通过手柄的旋进或旋出来实现。三个位置的指示通过抽屉座底座横梁上的指针显示。当处于“接通”位置时，主回路和二次回路均接通，当处于“试验”位置，主电路断开，并有绝缘隔板隔开，仅二次回路接通，可进行一些必要的动作试验，当处于“断开”位置时，主回路与二次回路全部断开。并且抽屉式断路器具有机械联锁装置，断路器只有在接通位置或试验位置才能使断路器闭合，而在接通与试验的中间位置断路器不能闭合。

接线端子

Terminal

断路器总体接线端子共47个，接线简单，便于用户使用，接线图见图7。

联锁机构

Interlock mechanism

联锁机构可用于多路电源供电的系统。

- 1 联杆联锁二个或三个叠装断路器（见图8）。
- 2 钢缆联锁二个平放断路器（见图9）。

其他脱扣器

Other release

1 欠电压脱扣器：在一定的电压范围内能使断路器断开或闭合。

2 分励脱扣器：可远距离操作断路器断开的脱扣器。

2 闭合电磁铁：断路器处于断开位置时，如要闭合断路器只要使电磁铁通电，即能使断路器闭合（但断路器闭合后如电磁铁失电，则断路器不会断开）。

安装、使用与维护

Installation, usage and maintenance

安装

- 安装前先检查断路器的规格是否符合要求。
- 安装前先以500V兆欧表检查断路器绝缘电阻，在周围介质温度为 $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 和相对湿度为50%~70%时绝缘电阻应不小于 $10\text{M}\Omega$ ，否则应烘干，待绝缘电阻达到要求方可使用。
- 断路器安装时，其底座应居于垂直于水平位置，并用M10螺钉固定。（见图10—14）
- 安装时对断路器进行可靠的接地保护，接地处有明显的接地标记，固定式断路器应严格遵守安全区。
- 断路器安装完毕按有关接线图接线后，在主电路通电前（抽屉式断路器即抽屉座上的指示指在试验位置）应进行下列操作试验。
 - a. 检查欠电压，分励脱扣器及闭合电磁铁、电动操作等附件电压是否相符（欠电压脱扣器应吸合，断路器才能操作）。
 - b. 上下扳动面罩上的手柄七次后面板显示“贮能”，并听到“咔嗒”声，即贮能结束，按动合闸按钮或闭合电磁铁通电，断路器可靠闭合，在脱扣器复位情况下扳动手柄能再次贮能。
 - c. 接通电动操作机构电源，电动机通电操作至面罩显示“贮能”，并伴随“咔嗒”声，贮能结束，电动机自动断电，按动合闸按钮或闭合电磁铁通电，断路器可靠闭合。
 - d. 断路器闭合后，无论用欠电压、分励脱扣器或面罩上的分闸按钮，只能型脱扣器的脱扣试验均应使断路器断开。

The draw out circuit breaker consists of circuit breaker body and the drawout cassettes, the slide rail in the drawout cassettes can insert switching-on by inserting the bus on the body into bridge-contact of drawout cassettes.

The draw out circuit breaker has three working positions: its changing is realized by rotating the racking handle in or out. The display of one of three positions is shown by the pointer on the base cross bar of drawout cassettes. When circuit breaker is in “CONNECT” position, the main circuit and secondary circuit is switching-on, when circuit breaker is in “TEST” position, the main circuit is switching-off, and isolated by insulation plate, only the secondary circuit is switching-on, the necessary operating test may be done, when circuit breaker is in “DISCONNECT” position, the main circuit and secondary circuit is switching-off. And the draw out circuit breaker is fitted with mechanical interlock unit, the circuit breaker can be closed only when in “CONNECT” position or “TEST” position, the circuit breaker can not be closed when in the middle position between “CONNECT”

Terminal of circuit breaker is total of 47, wiring is simple, easily used by user, the wiring diagram see figure 7.

The interlock mechanism may be used for multi-power supply system.
1.Two or three vertically stacked circuit breaker are interlocked by link gear (see figure 8)

2.Two paralleled circuit breaker are interlocked by cable. (see figure 9)

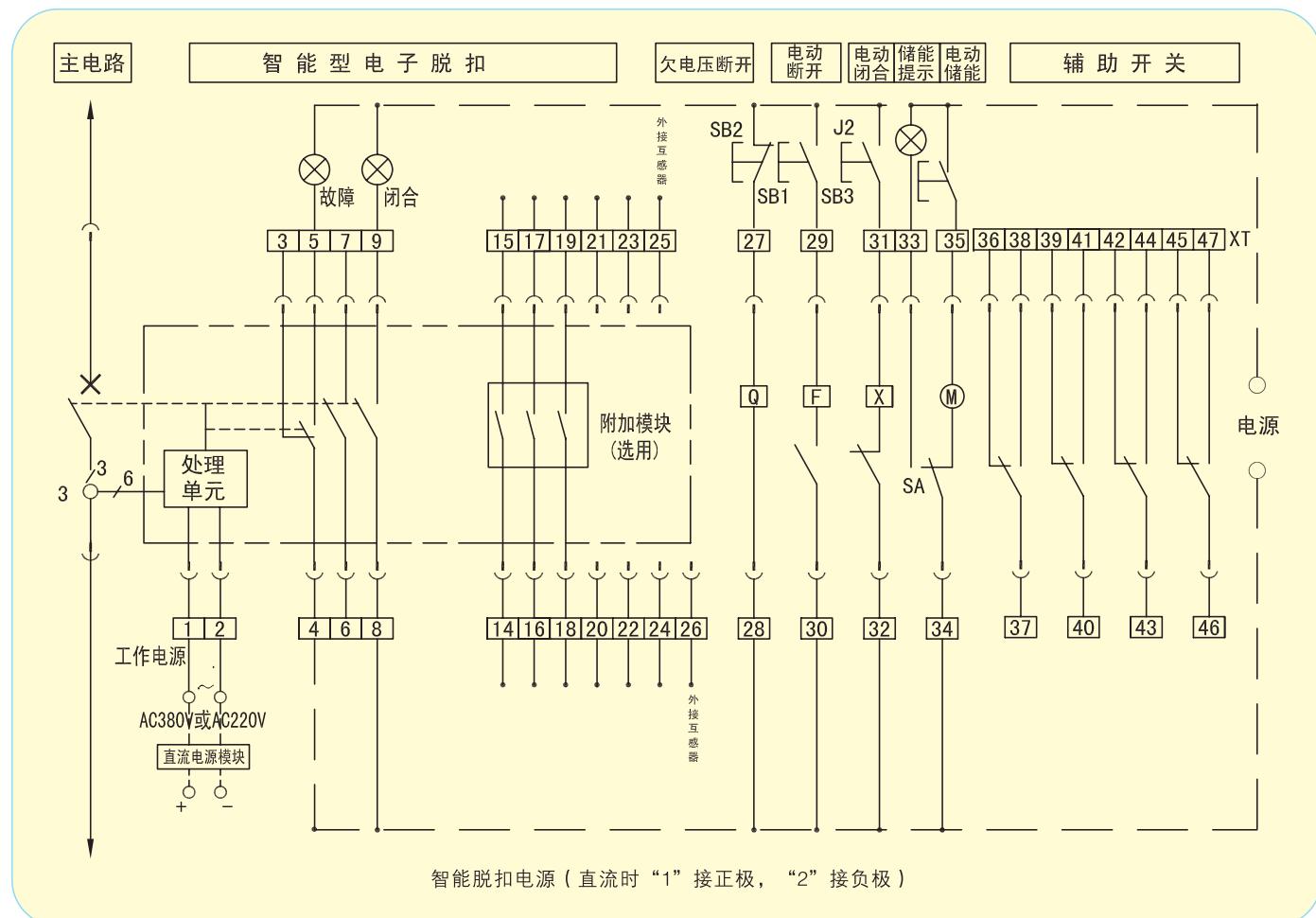
1. Under voltage release, within specified voltage range, enable circuit breaker opening or closing.

2. Shunt release, operate circuit breaker opening remotely.

3. Closing electromagnet: when the circuit breaker is in opening position, to close circuit breaker just energize the electromagnet is enough (but after closed, even it electromagnet power off, circuit breaker can not be opening).

Installation

- Before installing, check specification of circuit breaker for meet the requirements.
- Before installing, check insulation resistance of circuit breaker with 500V megohmmeter: when ambient temperature as $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and relative humidity as 50%~70%, the insulation resistance shall not be less than $10\text{M}\Omega$, if not, drying it until meet the requirements.
- When installing, circuit breaker base shall be vertical with the level position, and fixed by M 10 screw (see figure 10—14)
- When installing, circuit breaker shall be protected with reliable earthing, earthing spots shall have apparent earthing mark, for the fixed circuit breaker, the safety zone shall be observed strictly.
- After the installation of circuit breaker is finished and connected as per specified wiring diagram, before switching-on the main circuit (for draw out circuit breaker, the indicator on the drawout cassettes is the “TEST” position), proceed with the following operating test:
 - a.Check voltage of under voltage release, shunt release and electromagnet, electrical operator etc. accessories for correct(only when under voltage release is in pick up, operation of circuit breaker is possible).
 - b.Pull the handle on the housing up and down for 7 times, “stored energy” display on the face plate and “clatter” to be heard, the energy charging is finished, depress closing pushbutton or energizing the closing electromagnet, the circuit breaker closed reliably, if the release is in reset, pull the handle to store energy again.
 - c.Switching-on power supply of motor operator mechanism, motor is operating, until “stored energy” display on the face plate and “clatter” to be heard, the energy charging is finished, the motor is switching-off automatically, depress closing pushbutton or energizing the closing electromagnet, the circuit breaker closed reliably.
 - d. After the circuit breaker is closed, it may be opening by any tripping test of under voltage release, shunt release or OFF pushbutton on the housing, intelligent release.



Sb1分励按钮 Sb2欠电压按钮 SB3合闸按钮 Q欠电压脱扣器或欠电压延时脱扣器

F分励脱扣器 X合闸电磁铁 M贮能电机 SA行程开关

XT接线端子: #1 #2----工作电源输入;

#3、#4、#5----故障跳闸触点输出端子 (其中#4线公共端);

#14~#19----信号单元;

#20----保护地线

#21----电压输入端N

#22----电压输入端A相

#23----电压输入端B相

#24----电压输入端C相

#25~#26----外接互感器输入端(漏电保护时有);

注: 1)若Q、F、X、M的控制电源电压不同时, 应分别接相对应电源。

2)端子35 直接接电源(自动预储能), 也可串联常开按钮后接电源(手控预储能).

3)当智能脱扣器的工作电源为直流电源时, 需增加直流电源模块。

图7 断路器接线图
XT-Terminal



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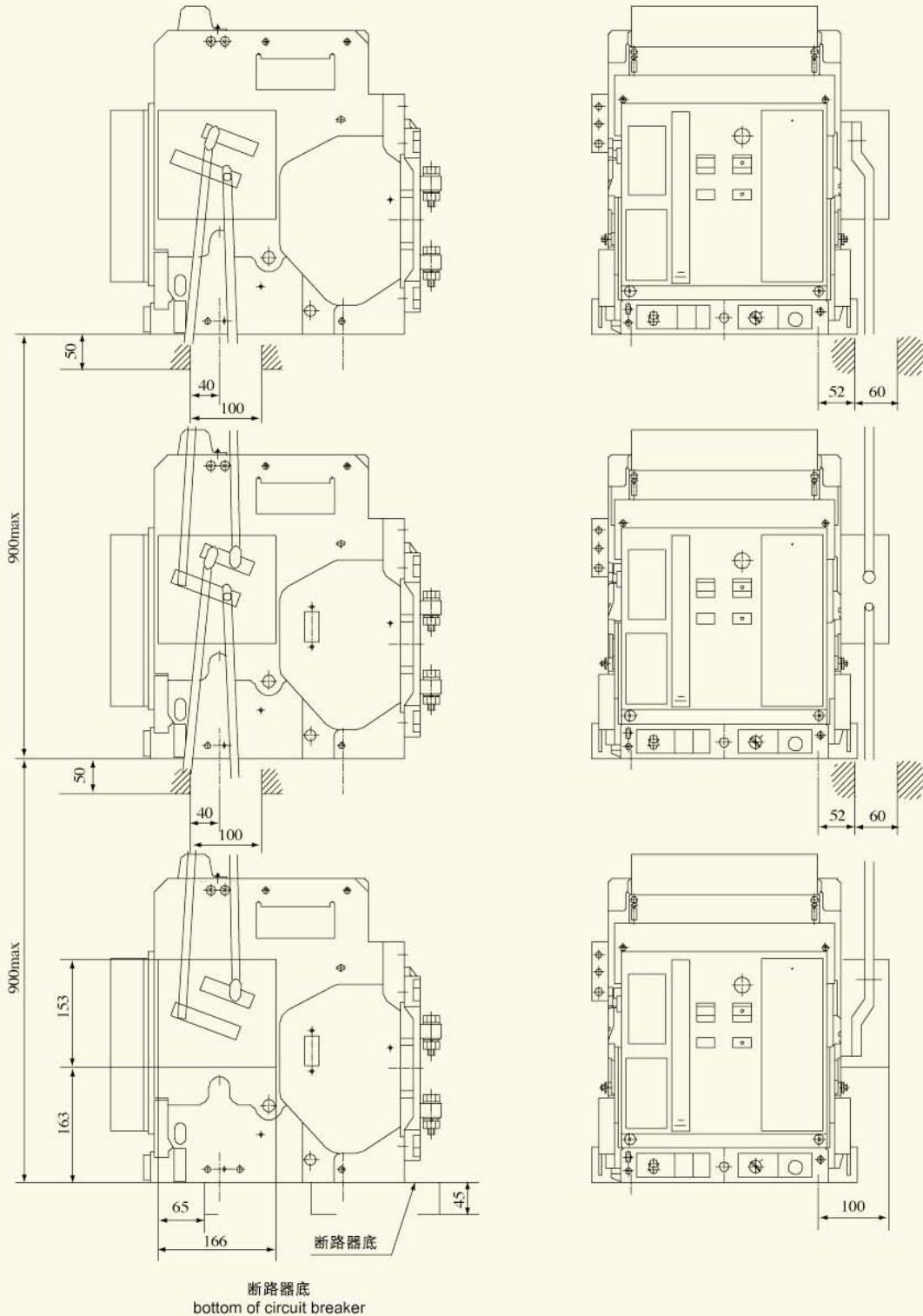


图8 用联杆联锁的3个垂直安装断路器。如二个断路器联锁只需除去最上面的断路器。
Figure 8 Three vertically installed circuit breaker to be interlocked with link gear.
If interlock two circuit breaker is needed, just remove the topmost circuit breaker.



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CNKW1 Series Intelligent Air Circuit Breaker }

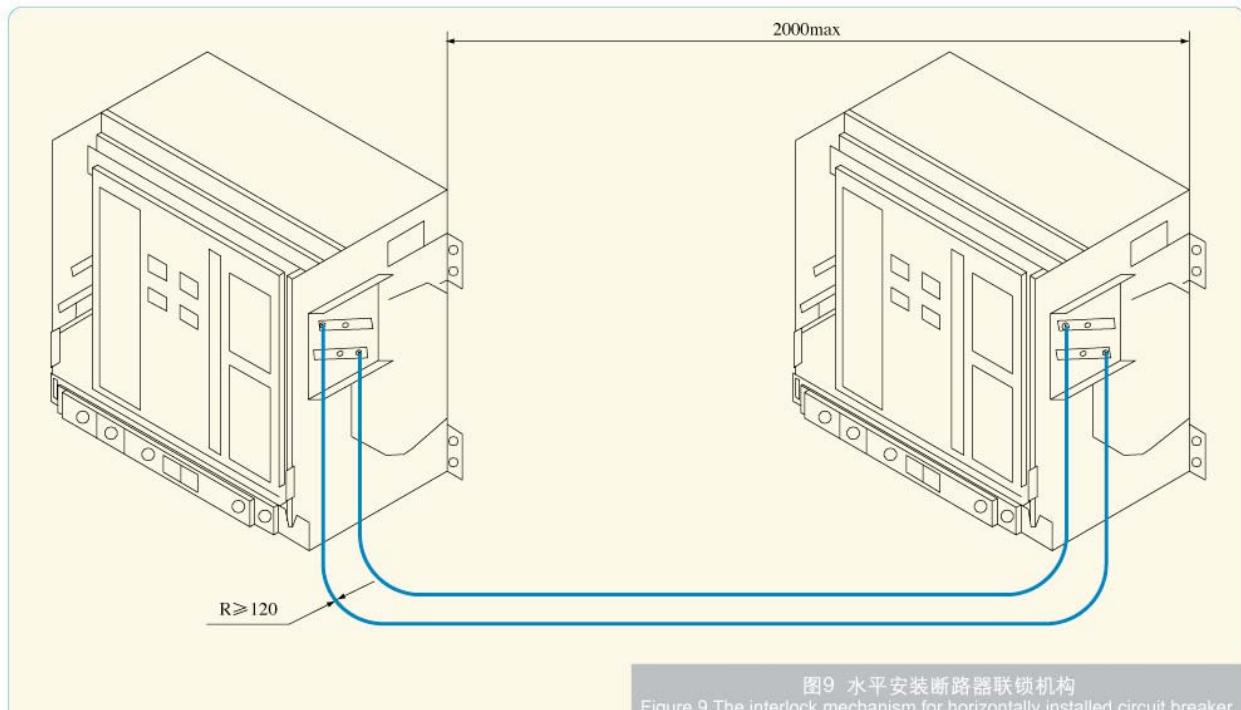
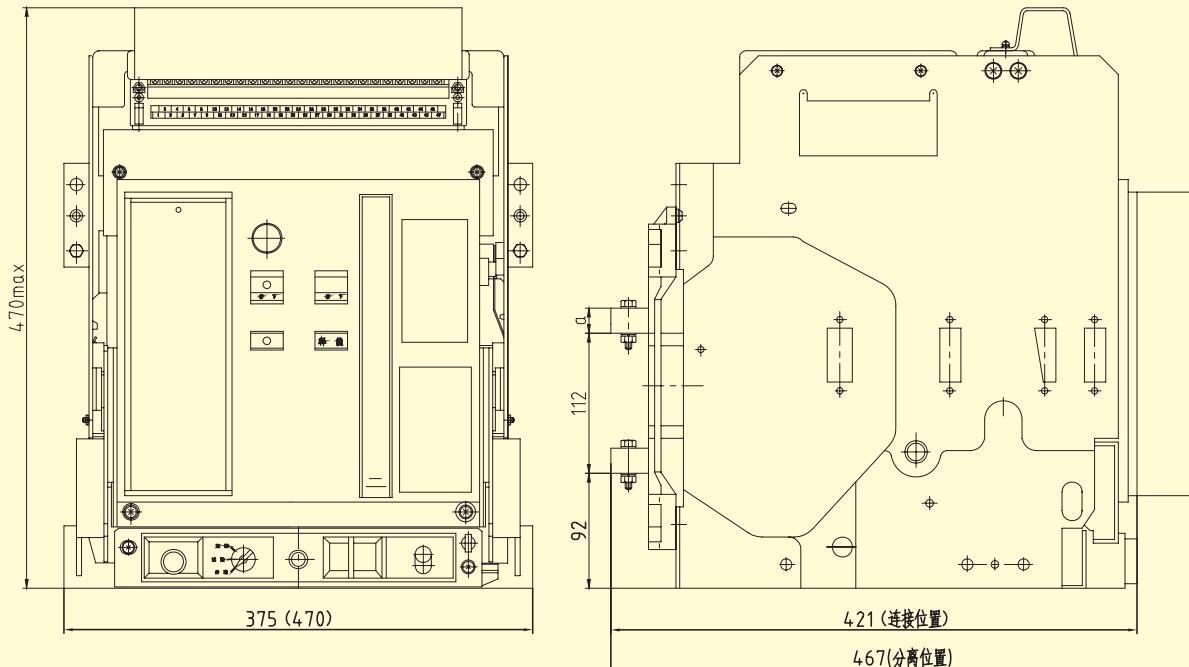


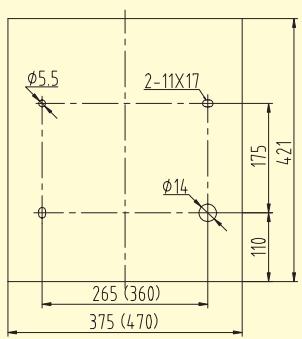
图9 水平安装断路器联锁机构
Figure 9 The interlock mechanism for horizontally installed circuit breaker



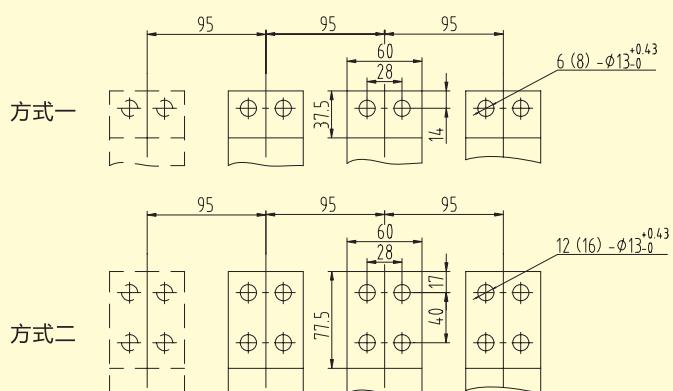
■ 外形及安装尺寸 Overall dimensions



最大底面外形尺寸及安装孔距



母排安装尺寸



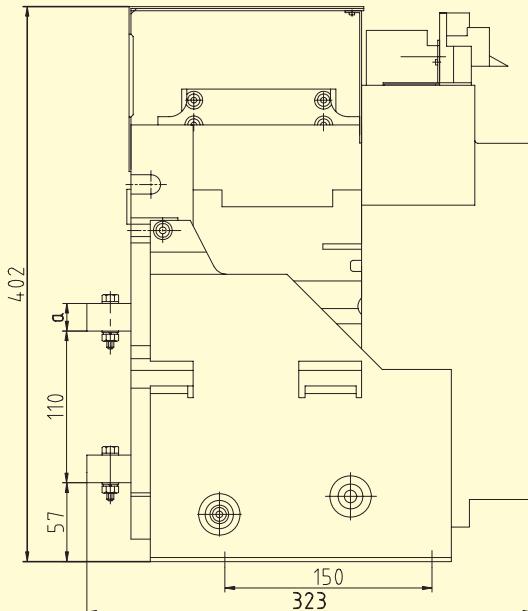
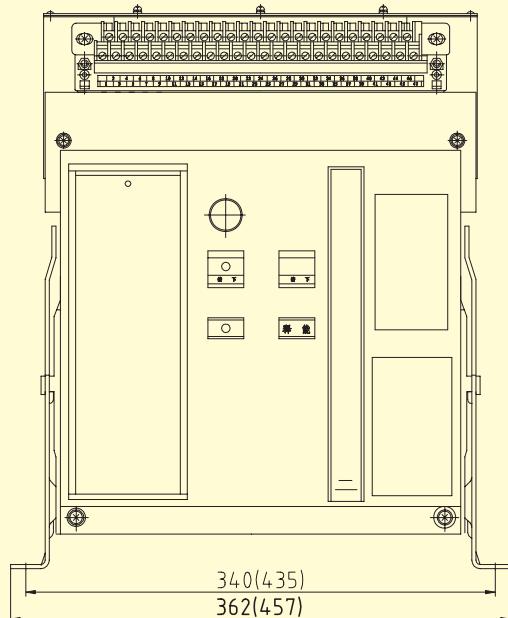
额定电流 In Rate current	母排厚度 a Thickness of bus
630,800	10
1000,1250,1600	15
2000	20

注：括号内尺寸为四级尺寸
Note: the size in the parentheses is for the 4-pole

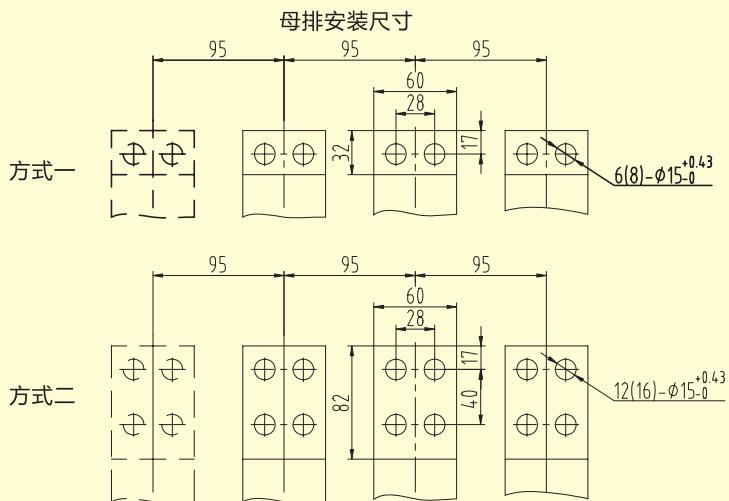
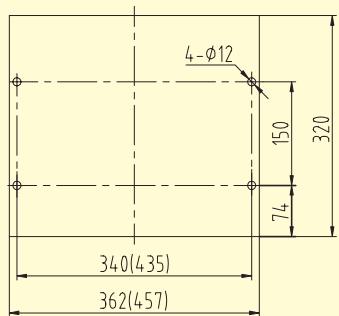
图10 抽屉式断路器安装与外形尺寸 (Inm=2000)
Figure10 Mounting and outline size of
withdrawable circuit breaker (Inm=2000)



CNKW-2000固定式断路器外形及安装尺寸



最大底面外形尺寸及安装孔距



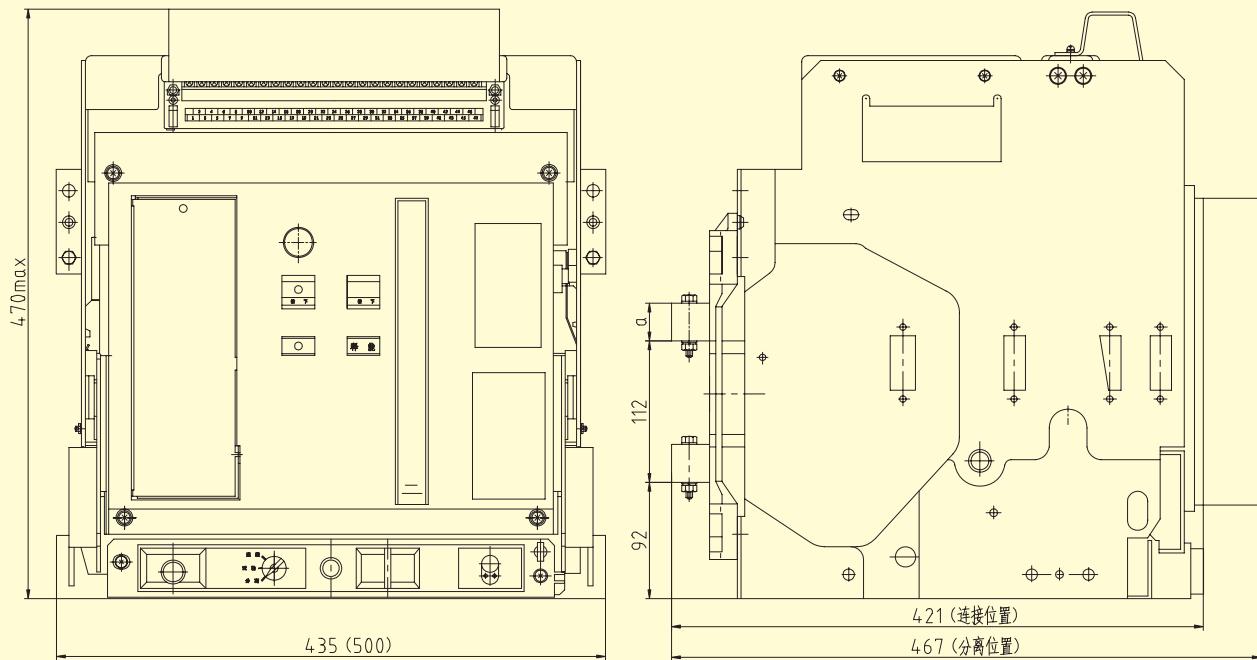
额定电流 In Rate current	母排厚度 a Thickness of bus
630,800	10
1000,1250,1600	15
2000	20

注：括号内尺寸为四级尺寸
Note:the size in the parentheses is for the 4-pole

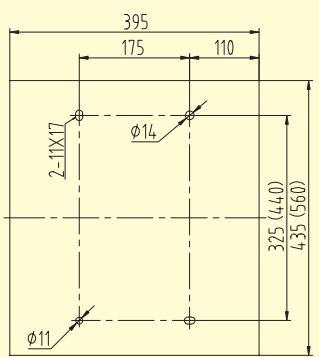
图11 固定式断路器安装于外形尺寸 (Inm=2000)
Mouting and outline size of fixed circuit breaker(Inm=2000)



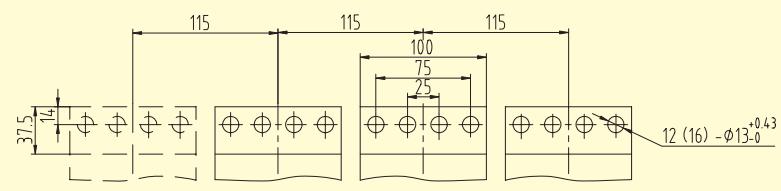
CNKW1 系列智能型万能式断路器 } *CNKW1 Series Intelligent Air Circuit Breaker*



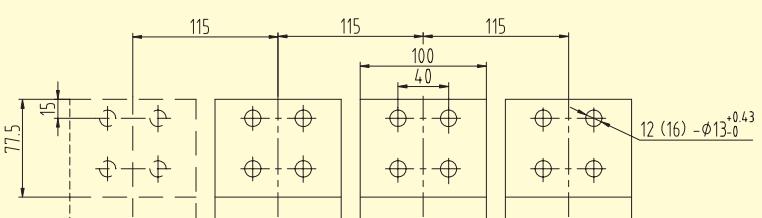
最大底面外形尺寸及安装孔距



方式一



方式二

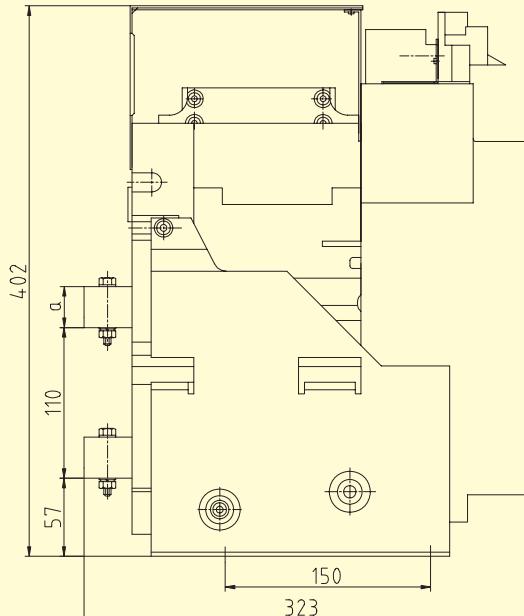
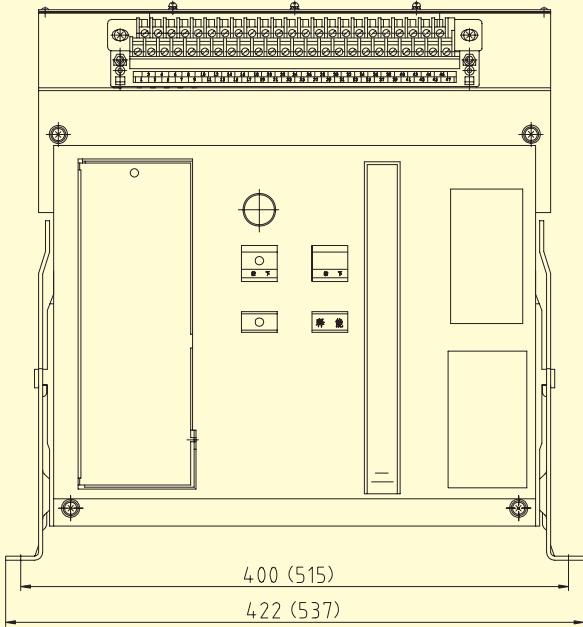


额定电流 In Rate current	母排厚度 a Thickness of bus
2000,2500	20
2900,3200	30

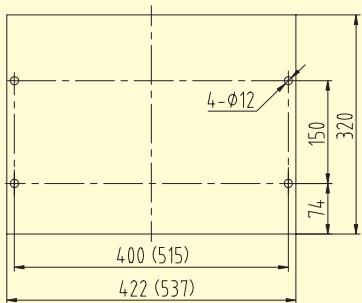
注：括号内尺寸为四级尺寸
Note:the size in the parentheses is for the 4-pole



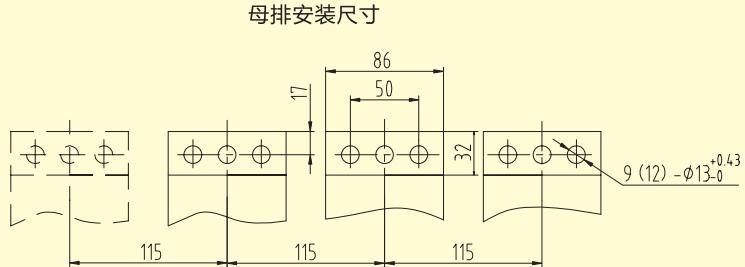
CNKW1 系列智能型万能式断路器
CNKW1 Series Intelligent Air Circuit Breaker



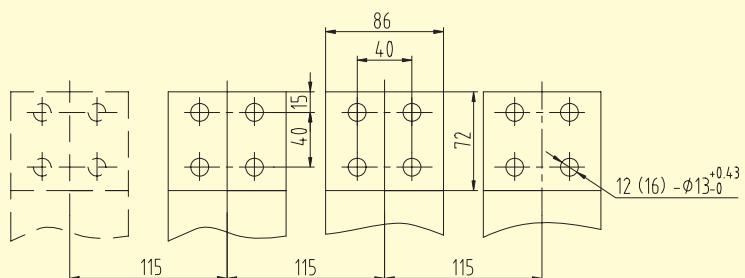
最大底面外形尺寸及安装孔距



方式一



方式二



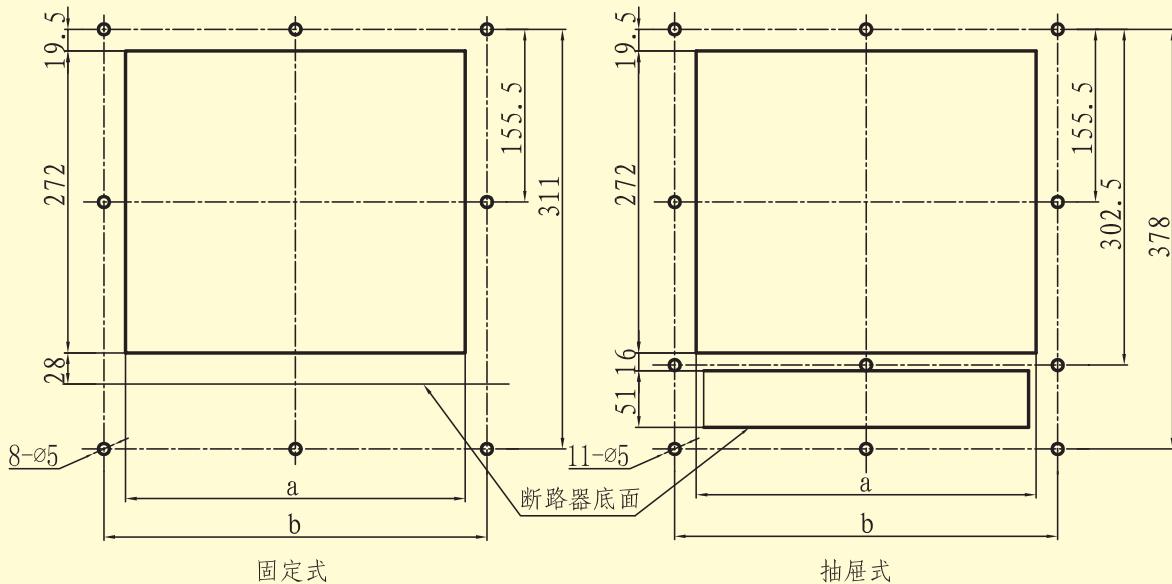
额定电流 In Rate current	母排厚度 a Thickness of bus
2000,2500	20
2900,3200	30

注：括号内尺寸为四级尺寸
Note:the size in the parentheses is for the 4-pole

图13 固定式断路器安装与外形尺寸 (Inm=3200)
Figure 13 Mouting and outline size of fixed circuit breaker(Inm=3200)



CNKW1 系列智能型万能式断路器
CNKW1 Series Intelligent Air Circuit Breaker



架壳等级额定电流Imm A
Frame Size rated current

	a	b
2000	306	345
3200	306	405

图14 柜门开孔尺寸和安装孔距
Figure 14 Door cut-out size and distance between mounting holes