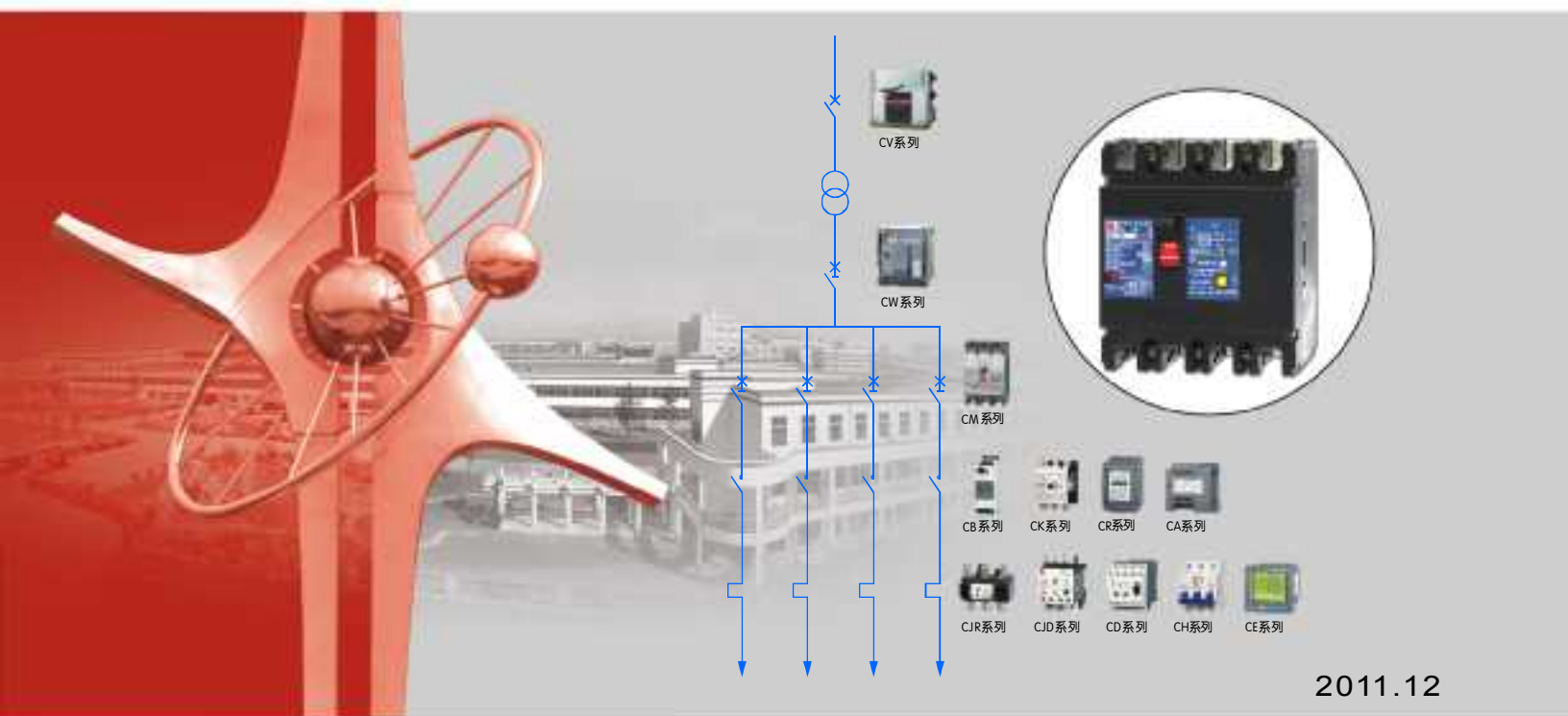




CM 1_L 系列带剩余电流 保护塑料外壳式断路器

CM1_L SERIES MCCB INCORPORATING RESIDUAL CURRENT PROTECTION



2011.12

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)



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



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



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



中国驰名商标
China Well-known Trademark



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



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



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



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



博士后科研工作站
Postdoctoral Programme

公司简介

Introduction

常熟开关制造有限公司是国有资产参股的电器制造企业、“国家重点高新技术企业”，占地约300亩，员工1685人。主要生产中低压电器元件、工控产品、太阳能光伏逆变器、成套装置等，可以为您提供“智能配电系统三位一体完整的解决方案”。

公司建有博士后科研工作站、省级企业技术中心和江苏省电器控制工程中心，具有一支以博士、硕士、本科生为主的多层次研发队伍，工程技术人员占企业员工总数的50%左右。公司拥有先进的模具制造、零部件自动化生产、断路器装配自动检测流水线等一大批先进的制造和试验检测设备；实施以ERP管理为重点的信息化、网络化管理；完善质量/环境/职业健康安全体系，确保为用户提供优质、安全、可靠的产品。公司“”商标被国家工商行政管理总局认定为中国驰名商标，CM系列塑料外壳式断路器、CW系列智能型万能式断路器曾双双被评为中国名牌产品。

Changshu Switchgear Mfg. Co., Ltd. (Former Changshu Switchgear Plant), an enterprise with state-owned equity, covered an area of 200,000 m², with 1685 staffs, is a "National Key New High-tech Enterprise" and mainly produces HV and LV electrical components, industry control products, solar photovoltaic inverters and complete sets of equipment etc, all of which could provide trinity and complete solutions for intelligent power distribution system.

Post - doctoral scientific research station, Province Enterprise Technique Center and Jiangsu Province Electrical Apparatus Control Engineering Research Center have been established and a multi-level professional technique team has been formed consisting of PHD candidates, postgraduates and university graduates. Engineers and technicians have covered 50% of all staffs.

Advanced mould manufacturing equipments, automation producing equipments for spare parts, assembling and inspecting lines for breakers and test equipments have been brought in. Meanwhile, information and network management, taking ERP management as the focal point, has been applied and quality environmental systems (ISO9001/ISO14001/OHSMS18001) have also been established and perfected to ensure reliability and safety for customers.

The registered trademark  has been recognized as Famous Trademark of China by State Administration for Industry and Commerce of China. And CM Series Moulded Case Circuit Breaker and CW Series Intelligent Air Circuit Breaker are both China Top Brand products.





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



CD1系列
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



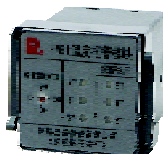
CI1系列
远程智能I/O模块



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

电气火灾探测



CSJ1系列剩余电流式电气
火灾监控探测器 (独立式)
CMSJ2系列剩余电流式电气
火灾监控探测器 (非独立式)
CSX1电气火灾监控设备

智能化通信低压配电网络监控系列



● Ri year-PowerNet配电监控系统



● FCX3智能配电监控器



优秀特色

- 具备TH型断路器，满足湿热带地区使用要求
- 通过了德国莱茵公司CE认证
- 获得国际认可的CB证书
- 具有体积小、分断高、带隔离等特点

额定极限短路分断能力 I_{cu} ：400V：50kA ~ 100kA

额定运行短路分断能力 I_{cs} ：400V：35kA ~ 65kA

- 剩余电流保护三相取电：常规的带剩余电流保护断路器的漏电保护模块工作电源取样为二相，本系列断路器为三相，若缺任一相，断路器漏电保护模块仍能正常工作
- 根据使用场合，可提供AC型（交流场合）和A型（交流叠加脉动直流场合）剩余电流断路器
- 提供不同剩余电流动作脱扣器可选，应用范围可从30mA ~ 30A 进行整定，动作时间可调

额定剩余动作电流 $I_{\Delta n}$ （A）：0.03/0.1/0.3/0.5、0.1/0.3/0.5、0.3/0.5/1、0.3/1/3/10、1/3/10/30 可调

$5I_{\Delta n}$ 最大断开时间 Δt （s）：瞬动/0.25/0.9/1.9可调

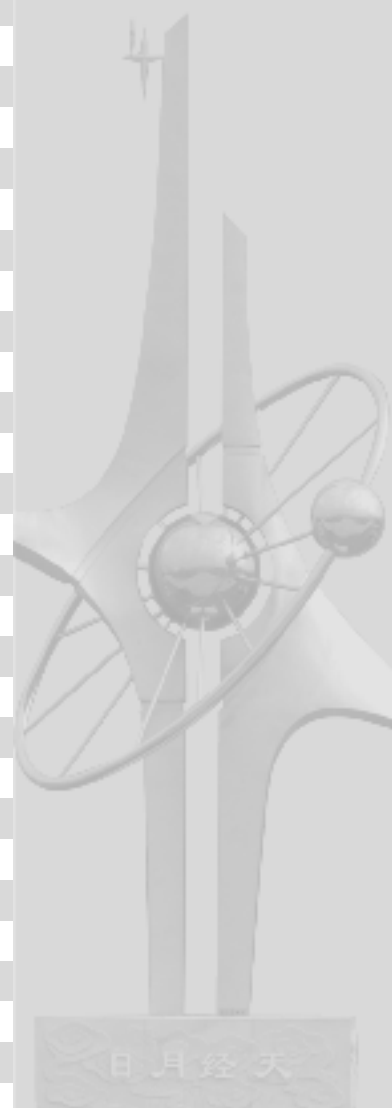
- 具有较强功能扩展性，可增选剩余电流报警模块，实现脱扣报警输出或不脱扣报警输出
- 可配FWB1温度报警模块，实现连接点在线超温报警





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CM1L系列带剩余电流保护塑料外壳式断路器（以下简称断路器），是公司采用先进的CAD/CAM/CAE设计、制造技术，研制、开发的新型断路器之一。其额定绝缘电压为800V，适用于交流50Hz/60Hz，额定工作电压400V，额定电流至630A的电路中作不频繁转换及电动机保护之用。断路器具有过载、短路和欠电压保护功能，能保护线路和电源设备不受损坏，同时，可对人提供间接接触保护，还可以对过电流保护不能检测出的长期存在的接地故障可能引起火灾危险提供保护。在其它保护装置失灵时，额定剩余动作电流为30mA的CM1L断路器可对直接接触起附加保护作用。VA型剩余电流脱扣器断路器在接地故障电流含有直流分量的情况下提供间接接触保护。

断路器按照其额定极限短路分断能力（ I_{cu} ）的高低，分为M型（较高分断型）、H型（高分断型）二类。该断路器具有体积小、分断高、飞弧短，抗振动等特点。

● 断路器可垂直安装（即竖装），亦可水平安装（即横装）。

● 断路器不可倒进线，即只允许1、3、5接电源线，2、4、6接负载线。

● 断路器适用于隔离，符号表示为“”。

● 断路器产品符合下列标准：

IEC60947-1及GB14048.1-2006 总则

IEC60947-2及GB14048.2-2008 断路器及附录B 具有剩余电流保护的断路器

IEC60947-4-1及GB14048.4 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。

CM1L series MCCB with residual current protection (hereafter simply referred to as breakers) are one of the new type breakers which have been developed by the company using advanced CAD/CAM/CAE design and manufacturing technology. The rated insulation voltage of the breakers is 800V, suitable for turn-on or turn-off not frequently and starting a motor not frequently in the circuit of AC50Hz/60Hz, rated working voltage 400V and rated current up to 630A. The breakers have overload, short-circuit and under voltage protection devices, so as to protect the circuit and the power equipment against damage. Synchronously, the breakers provide indirect contact protection for man, and protect the fire damage may caused by long-term existed earth fault, which can't be examined by the over-current protection device. Additionally, when other protective devices fail to function, CM1L breakers with the rated residual operating current of 30mA can protect man from the direct contact. The breaker of VA type residual current release can provide in direct contact protection in case of an earth fault comprising a d.c. component.

According to the rated ultimate short-circuit breaking capacity (I_{cu}), the breakers are classified into two kinds of types: M(second high breaking type), H(high breaking type). The breakers are of the following characteristics: compact size, high breaking capacity, short arc-over distance and shakeproof, etc.

● The breakers could be installed vertically (upright) or horizontally (transverse).

● The breakers can't be fed inversely, only allowing 1, 3, 5 connect with power supply wires, 2, 4, 6 connect with load wires.

● The breakers are applicable to isolation, its corresponding symbol is shown as “”.

● The breakers comply with the demands of the following standards:

IEC60947-1 and GB14048.1-2006 General rules

IEC60947-2 and GB14048.2-2008 circuit breakers and annex B circuit-breakers incorporating residual current protection

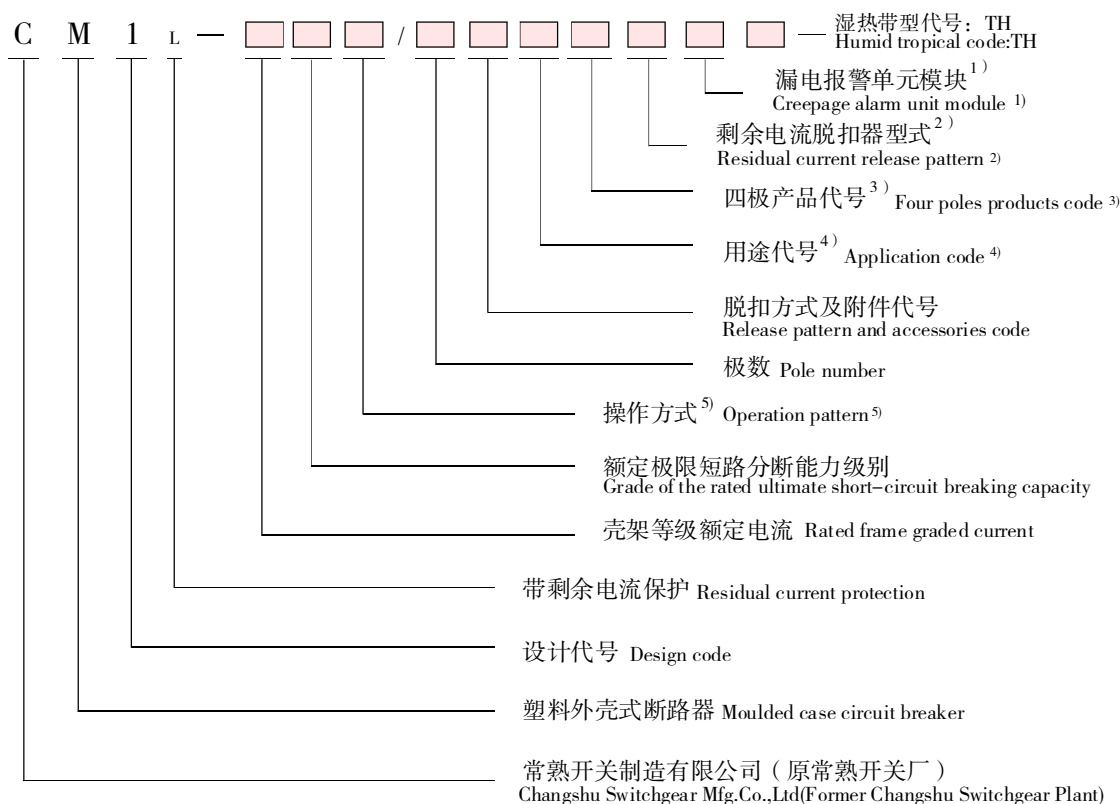
IEC60947-4-1 and GB14048.4 Electromechanical contactors and motor starters

● The breakers acquired the “CCC” certificates approved by CQC (China Quality Certification Centre).



型号及含义、分类 TYPE AND ITS MEANING, CLASSIFY

型号及其含义如下： Type and Its Meaning, Classify



注：1)不带漏电报警单元模块无代号；带漏电报警单元模块并在工作方式一时用 I 表示，在工作方式二时用 II 表示（详见 P25）。

2)剩余电流脱扣器型号分U型、V型、W型、VA型(详见 P7),V型为标准型，订货时不必注明。

3)三极产品无代号，四极时分A、B、C、D。

4)配电用断路器无代号，保护电动机用断路器以2表示。

5)手柄直接操作无代号；电动操作用P表示；转动手柄操作Z表示。

Note: 1) No code for no creepage alarm unit module; I for creepage alarm unit module under operation mode one, II for under operation mode two(particularly shown in P25).

2) The residual current release type is classified into three types: type U, type V, type W, type VA(particularly shown in P7). type V is standard type. and not necessary to mention in the ordering note.

3) No code for three poles breakers. Four poles breakers are classified into A, B, C, D.

4) No code for power distribution, 2 means for motor protection.

5) No code for operating directly with handle, P for motor operating and Z for rotary handle operating.

按产品极数分为三极与四极。四极产品中中性极（N极）的形式分四种：

A型：N极不安装过电流脱扣元件，且N极始终接通，不与其它三极一起合分；

B型：N极不安装过电流脱扣元件，且N极与其它三极一起合分；（N极先合后分）

C型：N极安装过电流脱扣元件，且N极与其它三极一起合分；（N极先合后分）

D型：N极安装过电流脱扣元件，且N极始终接通，不与其它三极一起合分。

注：建筑物内实施等电位联结的TN-C-S和TN-S系统，且不在电源转换处的CM1L四极断路器，中性极形式推荐采用A型或D型。

According to the pole number of product, it is classified into three poles and four poles. The neutral pole(N-pole) of the four-poles products has four types:

Type A: N-pole without over-current release unit, it has been connected all along, and dose not act with other three poles to turn on or off.

Type B: N-pole without over-current release unit, it could act with other three poles.(N-pole turns-on prior to turns-off).

Type C: N-pole fixed with over-current release unit, it could act with other three poles.(N-pole turns-on prior to turns-off).

Type D: N-pole fixed with over-current release unit, it has been connected all along, and dose not act with other three poles to turn on or off.

Note: The neutral pole type of CM1L four-pole circuit breaker which used in equal potential TN-C-S and TN-S system and not installed power supply changeover place is recommended to adopt type A or type D



型号及含义、分类 TYPE AND ITS MEANING, CLASSIFY

- 按额定电流（A）分：CM1L-100为10、16、20、25、32、40、50、63、80、100A十级；CM1L-225为100、125、140、160、180、200、225A七级；CM1L-400为225、250、315、350、400A五级；CM1L-630为400、500、630A三级。
- 按连接方式分为板前接线、板后接线、插入式板前接线、插入式板后接线、抽出式接线五种。
- 按过电流脱扣器型式分为热动-电磁（复式）型、电磁（瞬时）型两种。
- 按断路器是否带附件分带附件和不带附件两种：附件分内部附件和外部附件：内部附件有分励脱扣器、欠电压脱扣器、漏电报警单元模块、辅助触头和报警触头五种；外部附件有手动操作机构、电动操作机构、FWB1温度报警模块。

- Classification according to rated current: CM1L-100 has ten grades: 10, 16, 20, 25, 32, 40, 50, 63, 80, 100A; CM1L-225 has seven: 100, 125, 140, 160, 180, 200, 225A; CM1L-400 has five: 225, 250, 315, 350, 400A; CM1L-630 has three: 400, 500, 630A.
- The connected method has five: front connected, Rear connected, plug-in front connected, plug-in rear connected and draw-out connected.
- According to the over-current release pattern, it would be divided two types thermo-electromagnetic(double) type and electromagnetic(instantaneous) type.
- According to the outfit, it also has two types: with or without outfit. The outfit include inner accessories and outside accessories: The inner accessories have shunt release, under-voltage release, leakage alarm unit module, auxiliary contacts and alarm contacts five kinds. The outside accessories are rotary handle operator motor operator, FWB1 temperature alarm module.



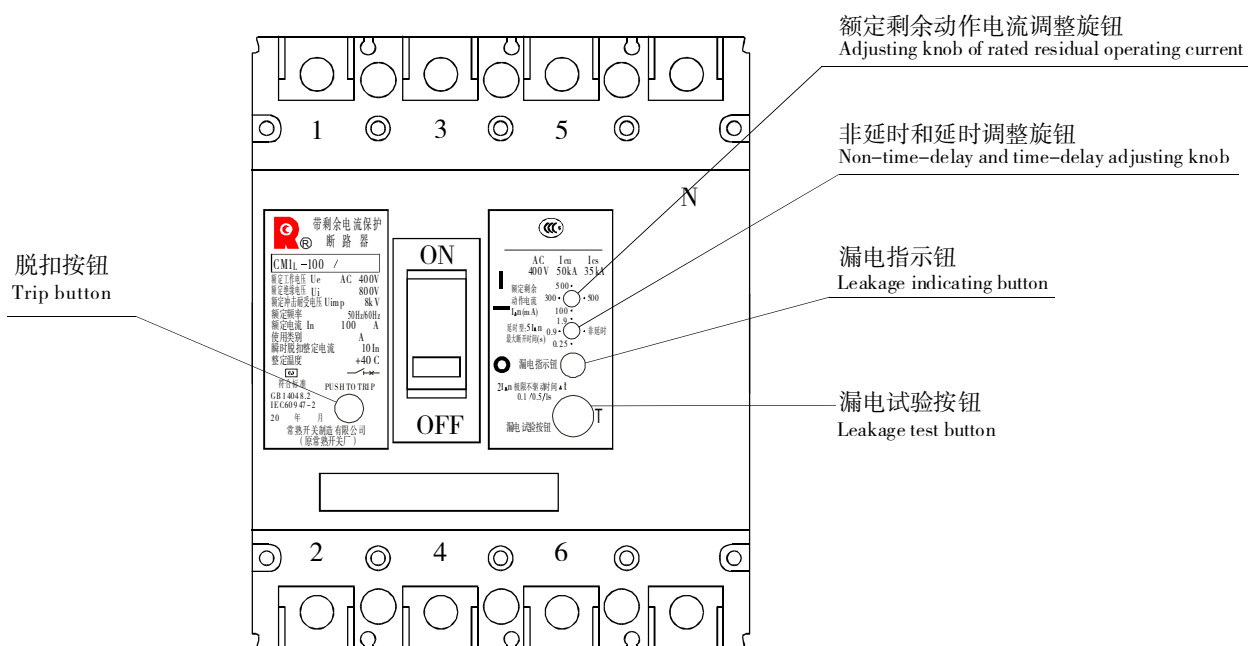
适用工作环境及安装条件 APPLICATION CONDITIONS FOR OPERATION AND INSTALLATION

- 安装地点的海拔2000m及以下；
- 周围介质温度不高于+40℃和不低于-5℃；且24小时平均值不超过35℃（特殊订货除外）；
- 安装地点的空气相对湿度在最高温度为+40℃时不超过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；
- 湿热型断路器空气相对湿度在+25℃时不超过95%；
- 污染等级为3级；
- 断路器主电路的安装类别为Ⅲ，不接至主电路的辅助电路和控制电路，安装类别为Ⅱ；
- 断路器适用于电磁环境A；
- 湿热型断路器能耐受湿热、盐雾、霉菌的影响；
- 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；
- 在没有雨雪侵袭的地方；
- 断路器应按产品的使用说明书安装。

- Elevation of installation site: $\leq 2000\text{m}$.
- Ambient temperature: $-5^{\circ}\text{C} \sim +40^{\circ}\text{C}$, and average temperature in 24 hours below $+35^{\circ}\text{C}$ (except special ordering).
- Relative humidity: not exceeding 50% at the maximum ambient temperature of $+40^{\circ}\text{C}$. With lower temperature, higher humidity would be permitted, for example, reaches 90% at the temperature of $+20^{\circ}\text{C}$, and special measures should be taken considering the dews on product surface due to temperature change.
- Relative humidity of the humid tropical area breakers isn't exceeding 95% at the temperature of $+25^{\circ}\text{C}$.
- Pollution protection: 3 grade.
- Installing categories: Ⅲ for breakers' main circuits; Ⅱ for auxiliary circuit and control circuit without connecting with main circuit.
- The breakers are suitable in electromagnetic environment A.
- The breakers used in humid tropical area can work normally without influence of humid air, salt fog and mildew.
- There must be not any explosive medium, and there must be not any gas which would corrode metal or any conducting dust which would destroy the insulation.
- The place would not be invaded by rain and snow.
- The breaker should be installed according to stipulations in operation manual.



结构简介 SYNOPSIS OF STRUCTURE

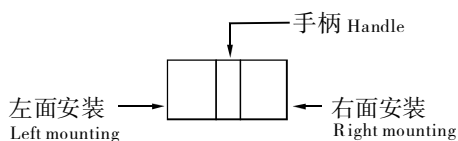




脱扣器方式及内部附件代号

RELEASE PATTERN AND ACCESSORIES CODE

- 脱扣器方式及内部附件代号见表一
Release pattern and accessories code see following Table 1 please



- 报警触头 Alarm contact
- 辅助触头 Auxiliary contact
- 分励脱扣器 Shunt release
- 欠电压脱扣器 Undervoltage release
- 引线方向 Lead direction

表一 Table 1

脱扣器方式及内部附件代号 Release pattern and accessories code	附件名称 Accessories name	型号 Type 极数及N极形式 Pole number and N-pole type	CM1L-100 CM1L-225		CM1L-400		CM1L-630	
			3极,4极A、B、C、D型 Type A、B、C、D of four poles	4极B、C型 Type B and C of four poles	3极,4极A、B、C、D型 Type A、B、C、D of four poles	4极B、C型 Type B and C of four poles	3极,4极A、B、C、D型 Type A、B、C、D of four poles	4极B、C型 Type B and C of four poles
208、308 ▲	报警触头 Alarm contact		□	—	□	—	□	—
210、310 ▲	分励脱扣器 Shunt release		●	—	●	—	●	—
220、320 ▲	辅助触头 Auxiliary contact		■	—	■	—	■	—
230、330 ▲	欠电压脱扣器 Undervoltage release		○	—	○	—	○	—
240、340	分励脱扣器 辅助触头 Shunt release,auxiliary contact		—	■ ●	—	■ ●	—	■ ●
250、350	分励脱扣器 欠电压脱扣器 Shunt release,undervoltage release		—	○ ●	—	○ ●	—	○ ●
260、360	二组辅助触头 Two group of auxiliary contact		—	—	—	■ ■	—	■ ■
270、370	辅助触头 欠电压脱扣器 Auxiliary contact,undervoltage release		—	—	—	○ ■	—	○ ■
218、318	分励脱扣器 报警触头 Shunt release,alarm contact		—	□ ●	—	□ ●	—	□ ●
228、328 ▲	辅助触头 报警触头 Auxiliary contact,alarm contact		■ □	—	■ □	—	■ □	—
238、338 ▲	欠电压脱扣器 报警触头 Undervoltage release,alarm contact		—	—	—	—	○ □	○ □
248、348	分励脱扣器 辅助触头 报警触头 Shunt release,auxiliary contact,alarm contact		—	■ □ ●	—	■ □ ●	—	■ □ ●
268、368	二组辅助触头 报警触头 Two group of auxiliary contact,alarm contact		—	—	—	■ ■ □	—	■ ■ □
278、378	辅助触头 欠电压脱扣器 报警触头 Auxiliary contact,Undervoltage release,alarm contact		—	—	—	—	○ ■ □	○ ■ □

注：① 脱扣器方式及内部附件代号首位数字2表示电磁（瞬时）脱扣器，3表示热动-电磁（复式）脱扣器；后两位数字表示内部附件代号，如无附件则用00表示。
② CM1L-400、630中228、328、248、348规格辅助触头为一对触头（即一常开，一常闭），268、368规格辅助触头为三对触头（即三常开，三常闭）；其余规格辅助触头数量按第27页表中配置。
③ CM1L-100、225中220、320、240、340规格辅助触头可提供二对触头（即二常开，二常闭），但须在订货时注明。
④ CM1L系列如带漏电报警单元模块，则附件只提供带▲规格。

Note: ① Release pattern and accessories codes' premier number 2 for electromagnetic (instantaneous) release pattern, 3 for thermo-electromagnetic (double) release pattern. Last two numbers stand for accessories code, two zero accessories code.
② CM1L-400 and CM1L-630, codes 228, 328, 248 and 348 have one pairs of auxiliary contacts (one normally-opened, one normally closed), but 268, 368 have three pairs of auxiliary contacts; while the amount of auxiliary contacts in terms of other specifications is disposed according to the diagrams on page 27.
③ CM1L-100, 225, codes 220, 320, 240 and 340 can provide two pairs of auxiliarys contacts (two normally opened, two normally closed), but note when making order.
④ Accessories code with "▲" is provided for leakage alarm unit module.



四极断路器规格 SPECIFICATION OF FOUR-POLES BREAKER

- 四极断路器中性极（N）设在产品右侧，其额定电流见表二
The N-pole of four-poles breaker is sited at the right side of the product,see following Table 2 please.

表二 Table 2

壳架等级额定电流Inm(A) Rated frame graded current Inm(A)	断路器额定电流In(A) Rated current of breaker In(A)	断路器中性极（N）额定电流（A） Rated current of breakers' N-pole(A)
100	10	10
	16	16
	20	20
	25	25
	32	32
	40	40
	50	50
	63	63
	80	63
	100	63
225	100	100
	125	100
	140	100
	160	100
	180	100
	200	100
	225	125
400	225	225
	250	225
	315	225
	350	250
	400	250
630	400	400
	500	400
	630	400

注：如用户需要，本公司可提供中性极（N）额定电流等于相极额定电流的断路器。

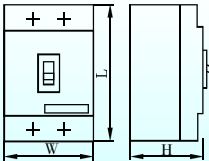
Note: We can supply breakers with the N-pole rated current equal to phase pole rated current, to satisfy the users.



主要技术指标 MAIN TECHNICAL PARAMETER

- 技术性能指标见表三、表四 The technical-performance index see following table 3、4 please

表三 Table 3

型号 Type			CM1L-100			CM1L-225			CM1L-400			CM1L-630		
壳架电流Inm (A) Frame Current			100			225			400			630		
额定电流In (A) Rated Current			10、16、20、25、32、40、50、63、80、100			100、125、140、160、180、200、225			225、250、315、350、400			400、500、630		
极数 Pole Number			3		4	3		4	3		4	3		4
额定绝缘电压Ui (V) Rated Insulation Voltage			AC800											
额定工作电压Ue (V) Rated operational Voltage			AC400			AC400			AC400			AC400		
额定冲击耐受电压Uimp(V) Rated impulse Withstand Voltage			8000			8000			8000			8000		
飞弧距离 (mm) Arc-over Distance			≥ 50(0)**			≥ 50(0)**			≥ 100(0)**			≥ 100		
分断能力级别 Class of the Breaking capacity			M	H		M	H		M	H		M	H	
极限短路分断能力Icu (kA) Ultimate Short-circuit Breaking capacity		AC400V	50	85	50	50	85	50	65	100	65	65	100	65
运行短路分断能力Ics (kA) Sevice short-circuit Breaking capacity		AC400V	35	50	35	35	50	35	42	65	42	42	65	42
使用类别 Utilization category			A											
额定剩余 动作电流 IΔn(A) Rated Residual Working Current	AC型剩余电流断路器 AC residual current breaker	U型, 非延时 Type U,non-time-delay	0.03/0.1/0.3/0.5			0.03/0.1/0.3/0.5			—			—		
		V型, 非延时、延时可调 Type V,non-time-delay、time-delay adjustable	0.1/0.3/0.5			0.1/0.3/0.5			0.1/0.3/0.5			0.3/0.5/1		
		W型, 非延时、延时可调 Type W,non-time-delay、time-delay adjustable	0.3/1/3/10			0.3/1/3/10			1/3/10/30			1/3/10/30		
	A型剩余电流断路器 A residual breaker	VA型, 非延时、延时可调 Type VA,non-time-delay、time-delay adjustable	0.1/0.3/0.5			0.1/0.3/0.5			0.1/0.3/0.5			0.3/0.5/1		
额定剩余不动作电流IΔno(mA) Rated Residual Non-operating Current			$\frac{1}{2} I_{\Delta n}$											
额定剩余短路接通(分断)能力IΔm(kA) Rated Residual Short-circuit making(Breaking) capacity			$\frac{1}{4} I_{cu}$											
电气寿命* (次 times) Electrical durability			8000			8000			7500			7500		
机械寿命* (次 times) Mechanical durability		免维护 Free maintenance	20000			20000			10000			10000		
		有维护 Maintenance	40000			40000			20000			20000		
外形尺寸(mm) Outline Dimensions			W	92	122	107	142	150	198	210	280			
			L	150	150	165	165	257	257	280	280			
			H	92	92	90	90	106.5	106.5	115.5	115.5			
分励脱扣器 Shunt Release			○	○	○	○	○	○	○	○	○	○	○	
欠电压脱扣器 Under-voltage release			○	○	○	○	○	○	○	○	○	○	○	
漏电报警单元模块 Leakage alarm unit module			○	○	○	○	○	○	○	○	○	○	○	
辅助触头 Auxiliary Contact			○	○	○	○	○	○	○	○	○	○	○	
报警触头 Alarm contact			○	○	○	○	○	○	○	○	○	○	○	
电动操作机构 Motor operator			○	○	○	○	○	○	○	○	○	○	○	
手动操作机构 Rotary handly operator			○	○	○	○	○	○	○	○	○	○	○	

注:1.极限分断与飞弧距离包含横装与竖装;

2.本系列三极断路器接三相负载时,负载不能带中性线,包括取自断路器负载端的负载控制回路电源也不能带中性线,否则该断路器会产生误动作;

3.本系列三极和四极断路器接单相负载时,相线接A极,中性线接C极,不要接B极。

*注:根据GB14048.1-2006,术语“寿命”表示电器在修理或更换部件前完成的操作循环次数的概率。

**注:CM1L-100、225、400分别选装高为6mm、7.5mm、9.3mm的零飞弧罩,实现零飞弧

Note: 1.Limiting breaking and arc-over distance can be vertically and horizontally installed.

2.The load can't have neutral wire,including the power supply of the load monitor circuit from the breakers' load terminals,when this series three phases breakers connecting with three-phases load,or the breakers will be misoperation.

3.When this series three-poles and four-poles breakers connecting with single phase load,the phase wire connects with A pole,and neutral wire connects with C pole,with B pole empty.

*Note:for GB14048.1-2006,the term"durability"expresses the expectancy of the number of operating cycles which can be performed by the equipment before repair or replacement of parts.

**note: Can be zero arcventing by installing arc cover of 6mm, 7.5 mm, 9.3mm for CM1L-100,225,400.



主要技术指标 MAIN TECHNICAL PARAMETER

表四 剩余电流保护动作时间
Table 4 operating time of the residual current protection

剩余电流 Residual current		$I_{\Delta n}$	$2I_{\Delta n}$	$5I_{\Delta n}$	$10I_{\Delta n}$
非延时 Non-time-delay	最大断开时间(s) Maximum break time	0.08	0.08	0.04	0.04
延时 Time-delay	最大断开时间(s) Maximum break time	0.5/1.15/2.15	0.35/1/2	0.25/0.9/1.9	0.25/0.9/1.9
	极限不驱动时间 Δt (s) Limiting non-actuating time	—	0.1/0.5/1	—	—



功率损耗及降容系数 POWER LOSS AND DERATING COEFFICIENT

- 功率损耗见表五 Power loss see following Table 5

表五 Table 5

型 号 Type	通电电流 (A) With current	三极/四极总功率损耗(W) The total power loss of three/four poles			
		板前、板后接线 Front/rear connected	插入式板前接线 Plug-in front conncted	插入式板后接线 Plug-in rear conncted	抽出式接线 Draw-out connected
CM1L-100 直热式(10A) Direct-heated	10	1.56	1.56	1.66	—
CM1L-100 间接热式(16~100A) Indirect-heated	100	15.6	15.6	15.8	—
CM1L-225	225	32	32	32.2	—
CM1L-400	400	67.2	67.2	67.4	87.2
CM1L-630	630	131	131	131.2	151

- 环境温度变化的降容系数见表六
Derating coefficient of ambient temperature change see following Table 6 please.

表六 Table 6

型 号 Type	环境温度 Temp.	+40℃	+45℃	+50℃	+55℃	+60℃
	系 数 Coefficient	降容系数 Derating coefficient	降容系数 Derating coefficient	降容系数 Derating coefficient	降容系数 Derating coefficient	降容系数 Derating coefficient
CM1L-100		1In	0.95In	0.89In	0.84In	0.76In
CM1L-225		1In	0.96In	0.91In	0.87In	0.82In
CM1L-400		1In	0.94In	0.87In	0.81In	0.73In
CM1L-630		1In	0.93In	0.88In	0.83In	0.76In



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 elevation exceeds work environment 2000m, electric property of circuit breaker can correct according to following table:

海拔 (m) Altitude	2000	3000	4000	5000
工频耐压(V) Power-frequency withstand voltage	3000	2500	2000	1800
工作电流修正系数 Correction coefficient of operational current	1	0.94	0.88	0.83



保护特性 PROTECTION FEATURE

- 断路器热动型脱扣器具有反时限特性；电磁脱扣器为瞬时动作，特性见表七(配电用)、表八(保护电动机用)。

The thermodynamic release of a circuit breaker provides the feature of inverse time-delay, while the magnetic release feature of instantaneous operation as shown on table 7 (distribution circuit breaker) and table 8 (motor protection circuit breakers)

表七 (配电用)

Table 7 (For Power Distribution)

脱扣器额定电流 Rated current of release (A)	热动型脱扣器(环境温度+40℃) Thermodynamic release(ambient temp. +40℃)		电磁脱扣器动作 电流(A) Electromagnetic release operating current
	1.05In(冷态) 不动作时间 1.05In(Cold state) Not operating time	1.30 In(热态) 动作时间 1.30In(Heat state) operating time	
10≤In≤63	1小时内不动作 Not operating within one hour	≤1h动作 Operating	10In ± 20%
63<In≤140	2小时内不动作 Not operating within two hours	≤2h动作 Operating	
140<In≤630	2小时内不动作 Not operating within two hours	≤2h动作 Operating	5In ± 20% 10In ± 20%

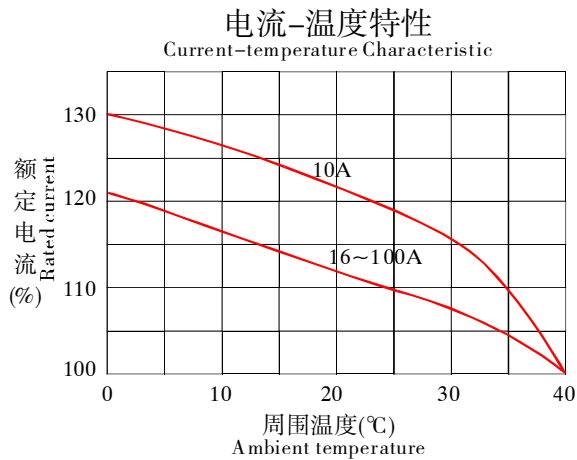
注：对CM1L-225四极断路器，其中性极（N）的电磁脱扣器（短路保护）无5In规格。

Note: There is no 5In electromagnetic release of N-pole in CM1L-225.

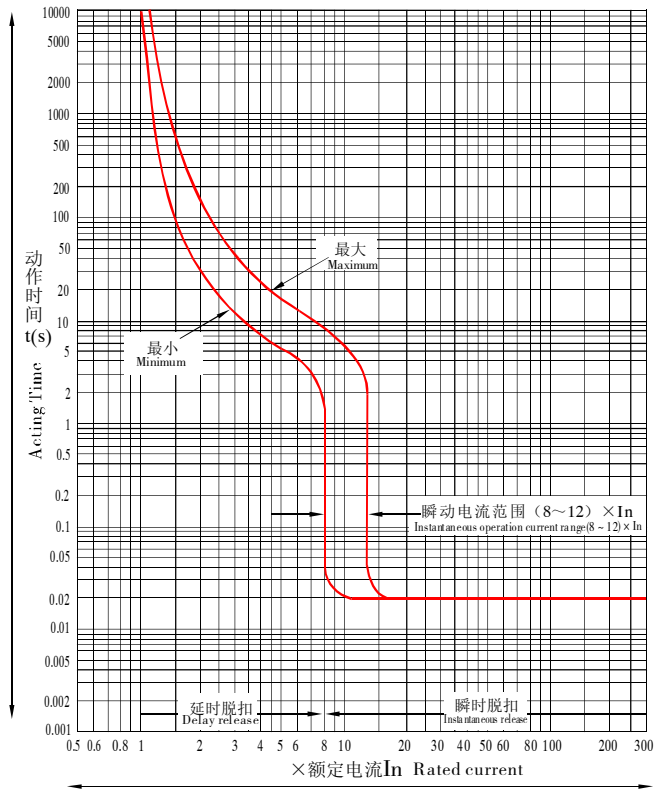
表八 (保护电动机用)

Table 8 (For motor protection)

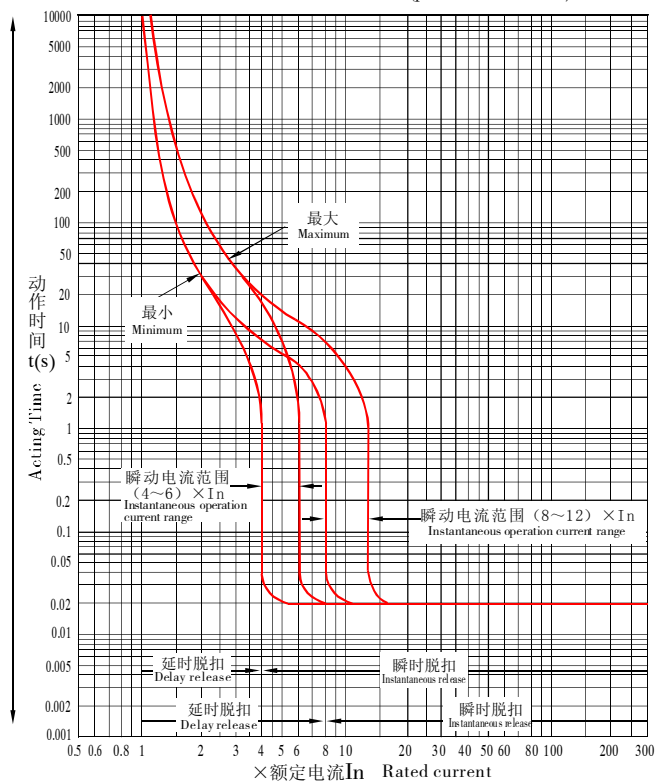
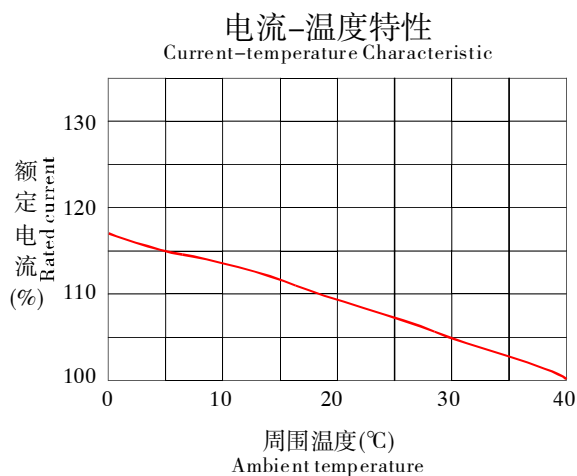
脱扣器额定电流 Rated current of release (A)	热动型脱扣器(环境温度+40℃) Thermodynamic release(ambient temp. +40℃)					电磁脱扣器动作 电流(A) Electromagnetic release operating current
	1.0In(冷态) 不动作时间(h) 1.0In(Cold state) Not operating time	1.20 In(热态) 动作时间 1.20In(Heat state) Operating time	1.50 In(热态) 动作时间 1.50In(Heat state) operating time	7.2In(冷态) 动作时间 7.2In(Cold state) operating time	脱扣级别 Trip class	
10≤In≤630	2小时内不动作 Not operating within two hours	≤2h动作 Operating	8min	6s < Tp ≤ 20s	20	12In ± 20%



CM1L-100M、H时间/电流特性曲线（配电）
CM1L-100M、H Time/Current Characteristic curve(power distribution)



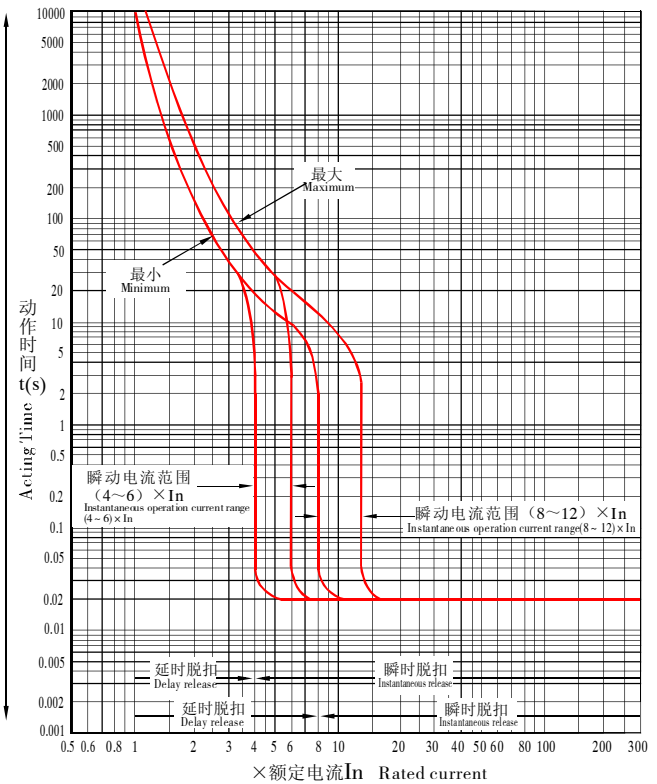
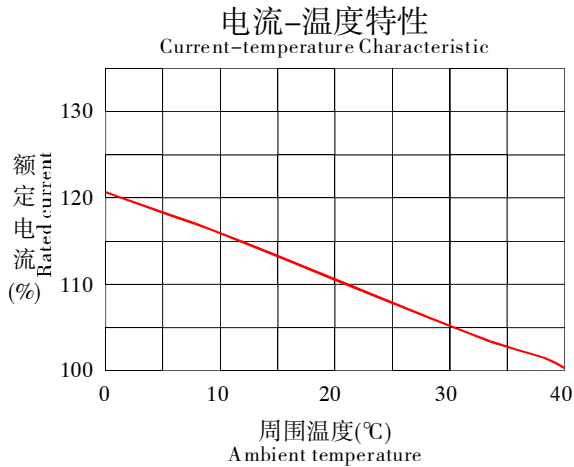
CM1L-225M、H时间/电流特性曲线（配电）
CM1L-225M、H Time/Current Characteristic curve(power distribution)



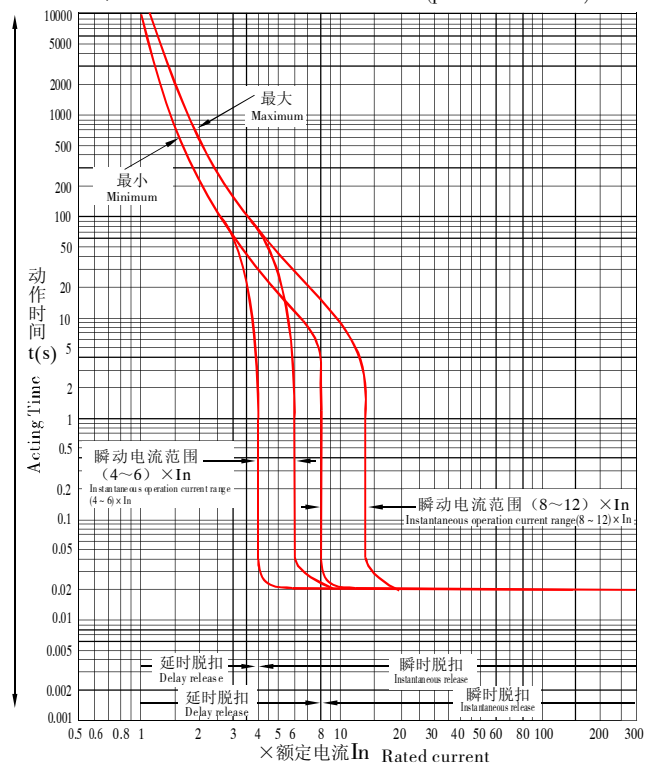
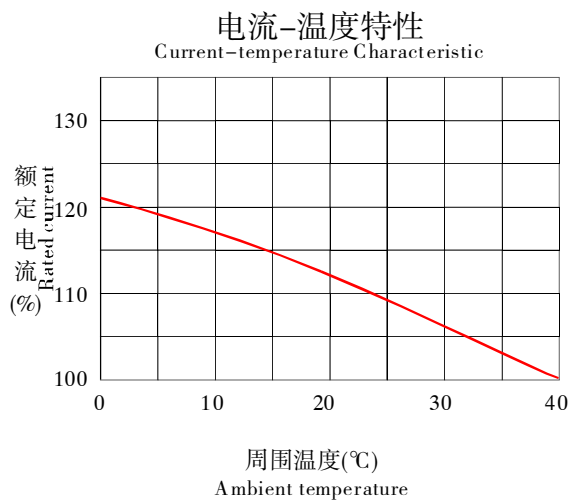


断路器特性曲线 CHARACTERISTIC CURVE OF THE BREAKER

CM1L-400M、H时间/电流特性曲线（配电）
CM1L-400M、H Time/Current Characteristic curve(power distribution)



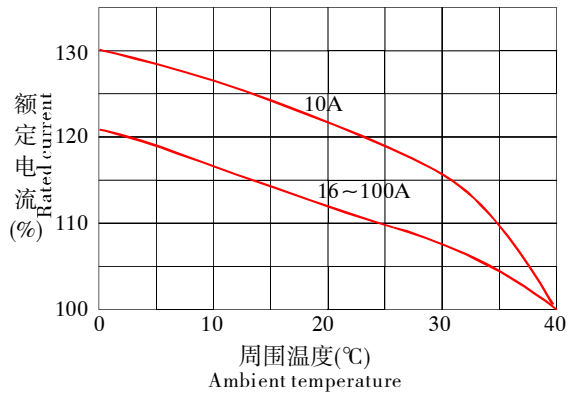
CM1L-630M、H时间/电流特性曲线（配电）
CM1L-630M、H Time/Current Characteristic curve(power distribution)



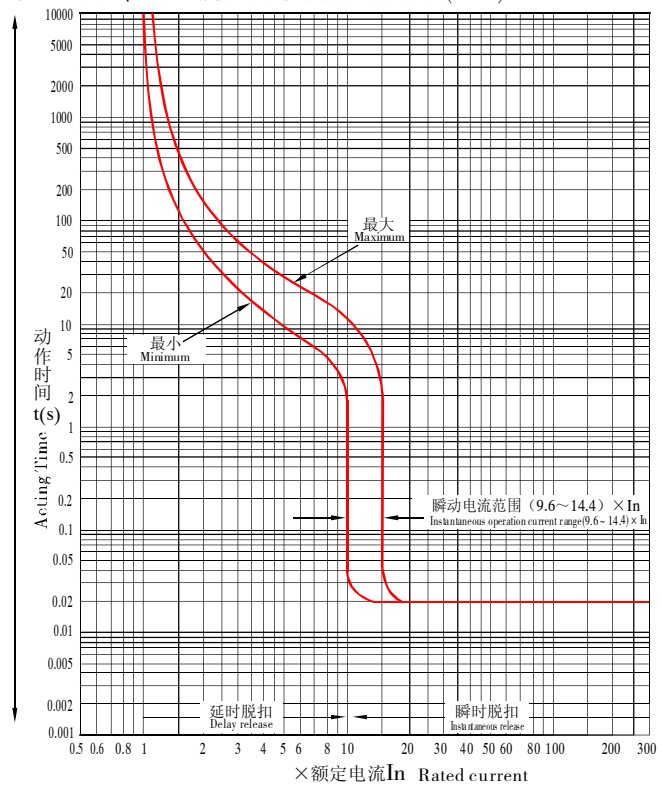


电流-温度特性

Current-temperature Characteristic

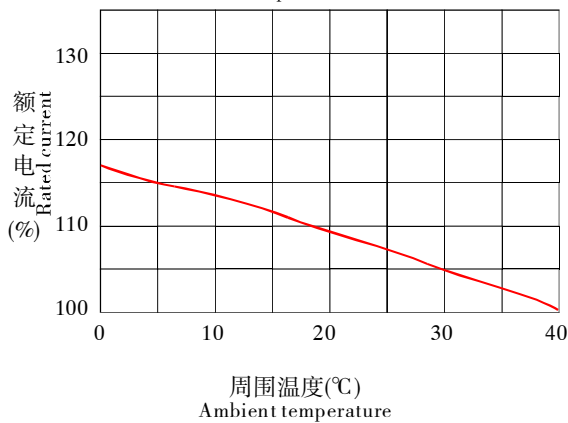


CM1L-100M、H时间/电流特性曲线（电动机）
CM1L-100M、H Time/Current Characteristic curve (motor)

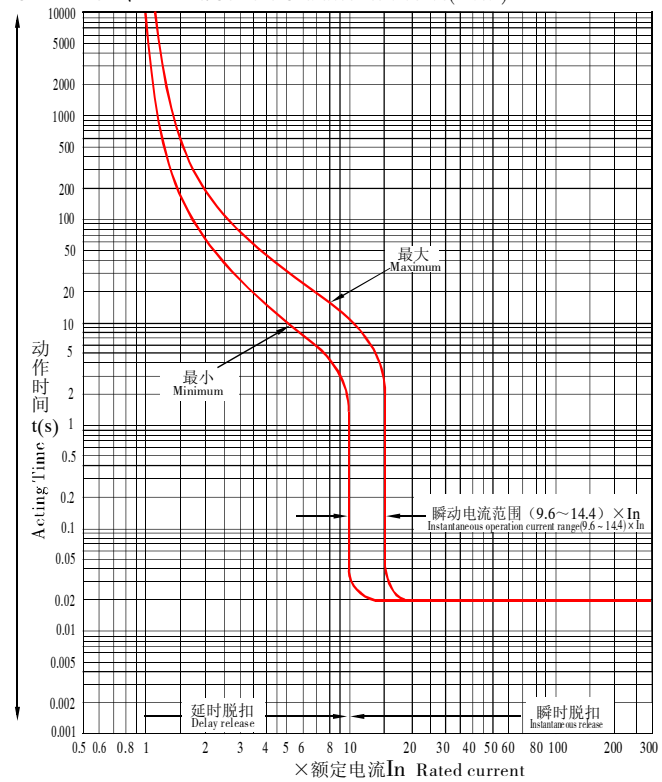


电流-温度特性

Current-temperature Characteristic



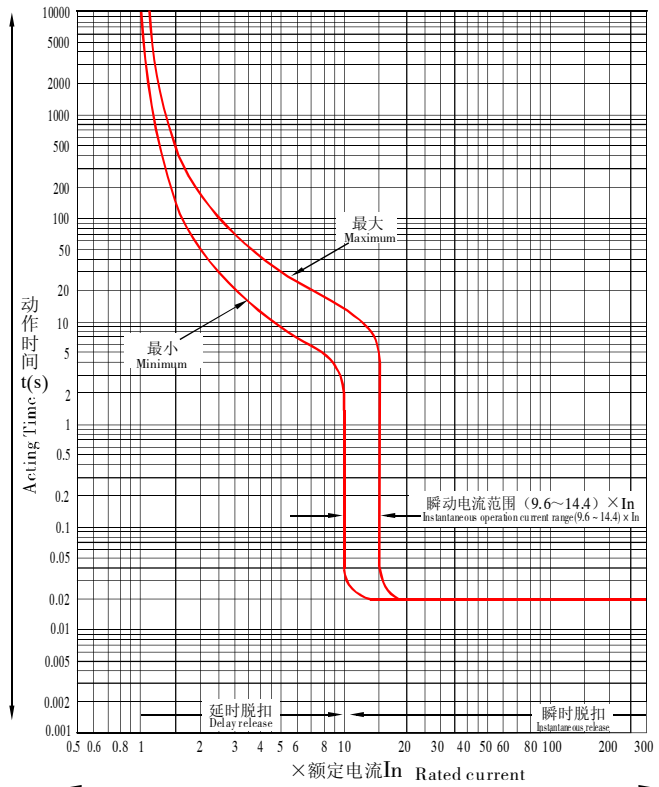
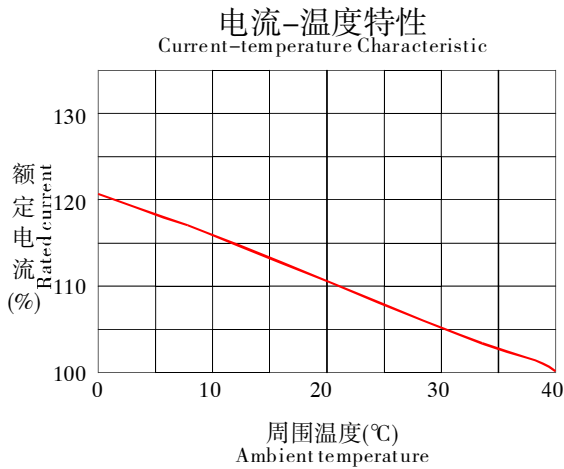
CM1L-225M、H时间/电流特性曲线（电动机）
CM1L-225M、H Time/Current Characteristic curve (motor)



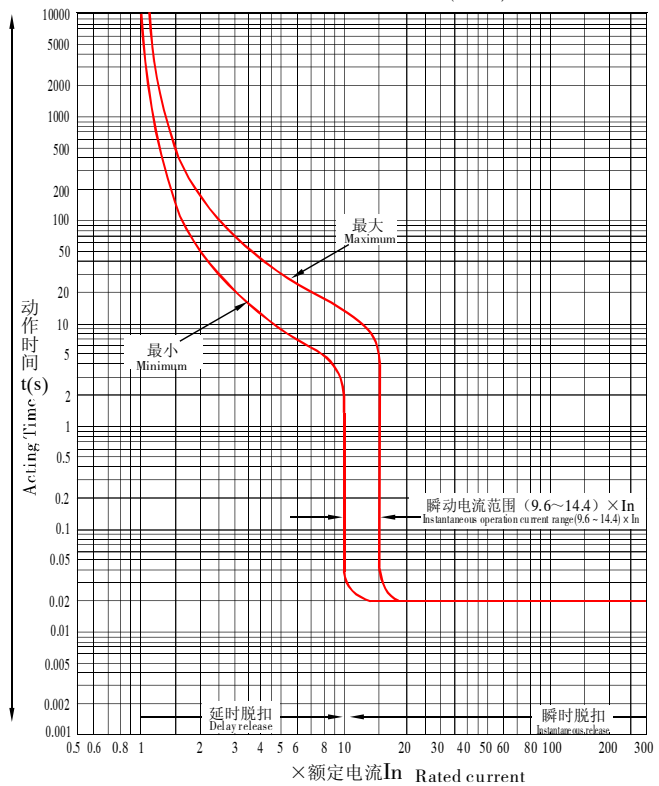
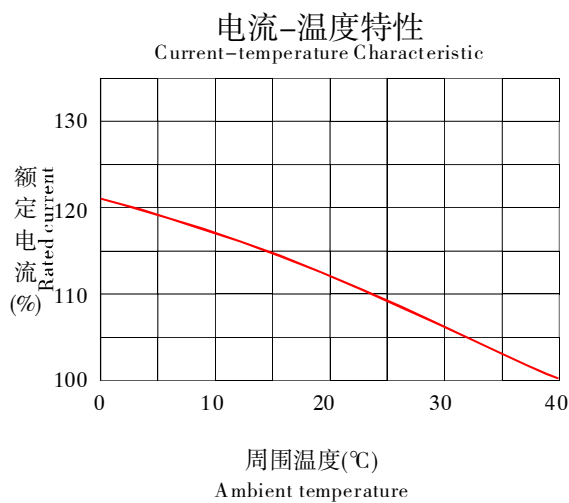


断路器特性曲线 CHARACTERISTIC CURVE OF THE BREAKER

CM1L-400M、H时间/电流特性曲线（电动机）
CM1L-400M、H Time/Current Characteristic curve(motor)



CM1L-630M、H时间/电流特性曲线（电动机）
CM1L-630M、H Time/Current Characteristic curve(motor)



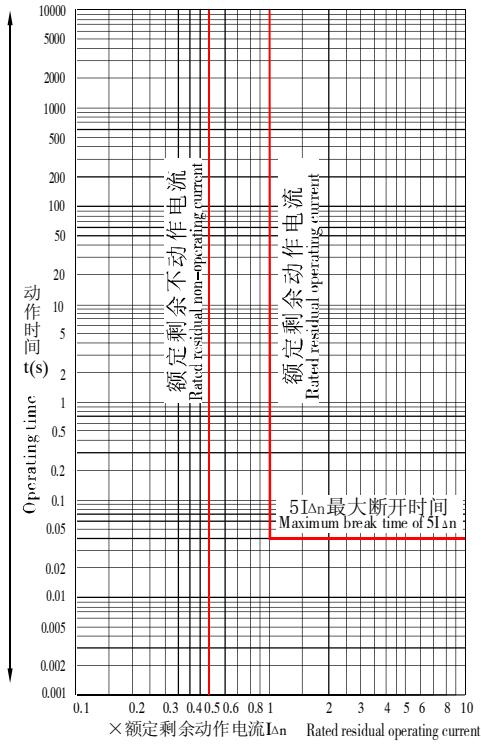


剩余电流保护特性曲线 RESIDUAL CURRENT PROTECTION CHARACTERISTIC CURVE

$I_{\Delta n}=0.03/0.1/0.3/0.5/1/3/10/30$ (A)

非延时剩余电流保护时间/电流特性曲线

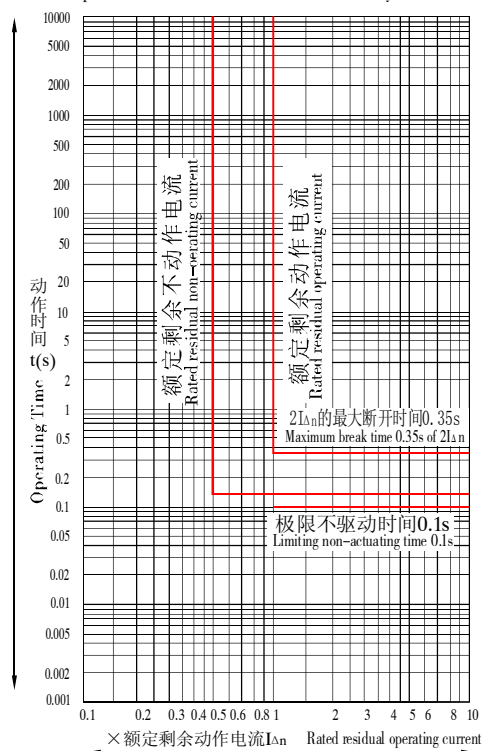
Time/current characteristic curve of non-time-delay residual current protection



$I_{\Delta n}=0.1/0.3/0.5/1/3/10/30$ (A)

延时剩余电流保护时间/电流特性曲线

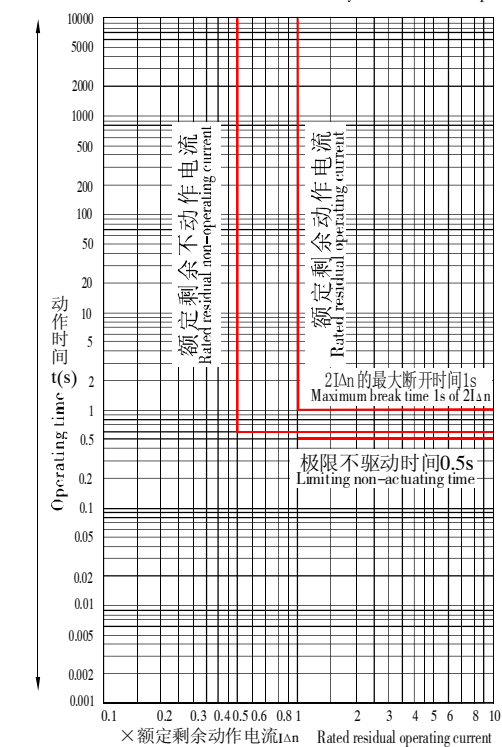
Time/temperature characteristic curve of time-delay residual current protection



$I_{\Delta n}=0.1/0.3/0.5/1/3/10/30$ (A)

延时剩余电流保护时间/电流特性曲线

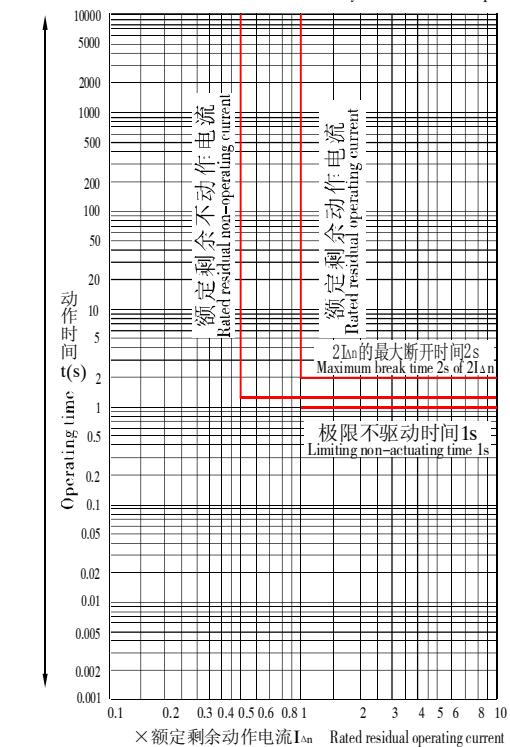
Time/current characteristic curve of time-delay residual current protection



$I_{\Delta n}=0.1/0.3/0.5/1/3/10/30$ (A)

延时剩余电流保护时间/电流特性曲线

Time/current characteristic curve of time-delay residual current protection





Front connected(three/four poles)
X-X、 Y - Y as the center of three poles breaker



欠电压脱扣器厚度:
C型 m=21
The thickness of under-voltage
release:type C m=21

Rear connected (three/four poles)
X-X、 Y - Y as the center of three poles breaker

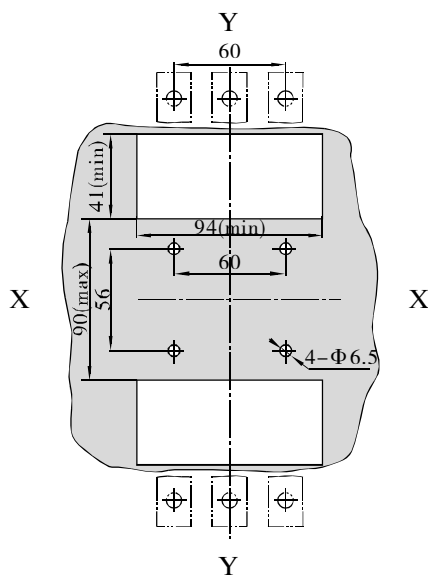
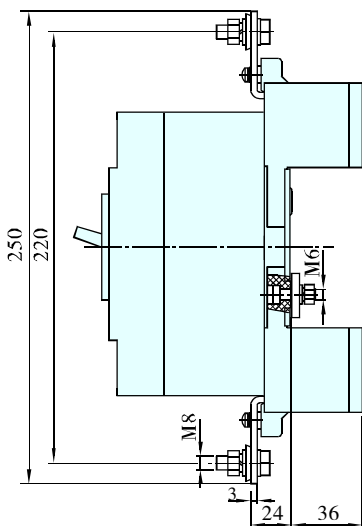




外形尺寸及安装尺寸 OUTLINE DIMENSIONS AND MOUNTING DIMENSIONS

CM1L-100插入式板前接线（三极）
X-X、Y-Y为三极断路器中心

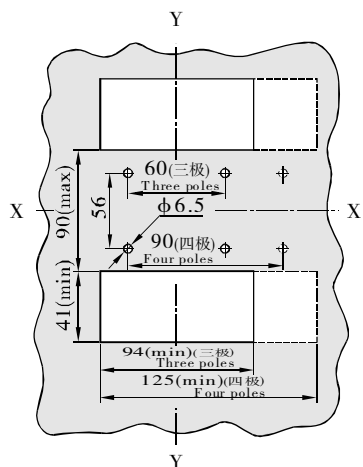
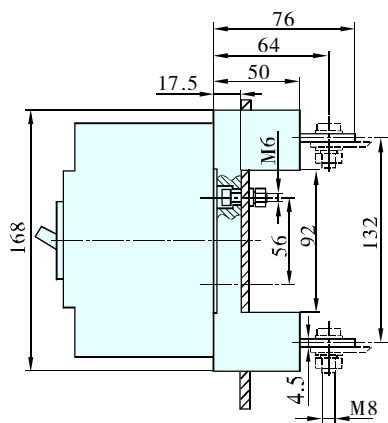
Plug-in front connected (three poles)
X-X、Y-Y as the center of three poles breaker



插入式板前接线安装板开孔尺寸
Mounting plate cutout dimensions of plug-in front connected

CM1L-100插入式板后接线（三极、四极）
X-X、Y-Y为三极断路器中心

Plug-in rear connected (three/four poles)
X-X、Y-Y as the center of three poles breaker

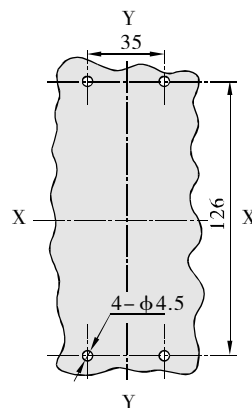
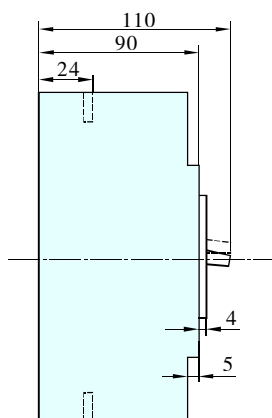


插入式板后接线安装板开孔尺寸
Mounting plate cutout dimensions of plug-in rear connected



X-X、Y-Y为三极断路器中心

X-X、 Y - Y as the center of three poles breaker

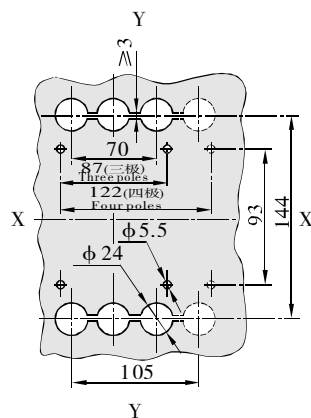
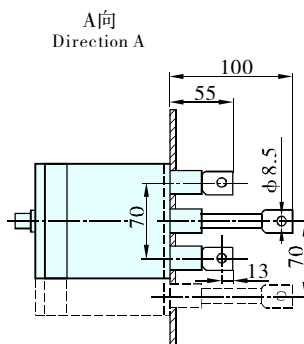


Mounting plate cutout dimensions of front connected

The thickness of under-voltage release: type C m=21

X-X、Y-Y为三极断路器中心

X-X、 Y - Y as the center of three poles breaker



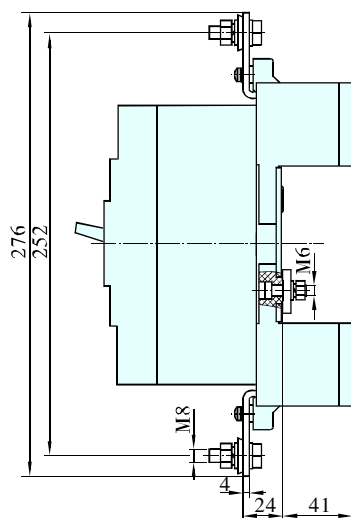
Mounting plate cutout dimensions of rear connected



外形尺寸及安装尺寸 OUTLINE DIMENSIONS AND MOUNTING DIMENSIONS

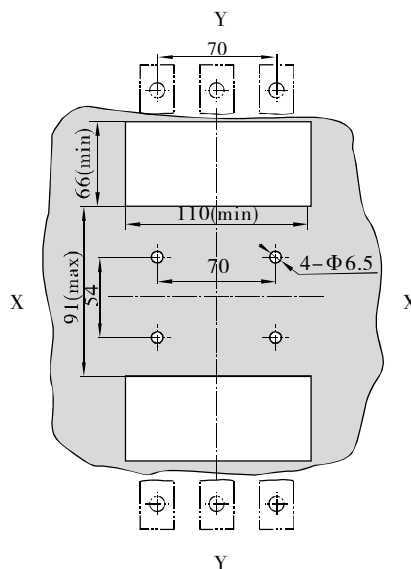
CM1L-225插入式板前接线（三极）

X-X、Y-Y为三极断路器中心



Plug-in front connected (three poles)

X-X、Y-Y as the center of three poles breaker

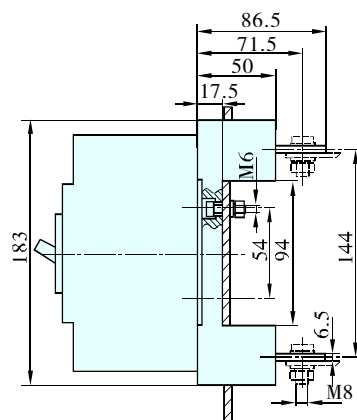


插入式板前接线安装板开孔尺寸

Mounting plate cutout dimensions of plug-in front connected

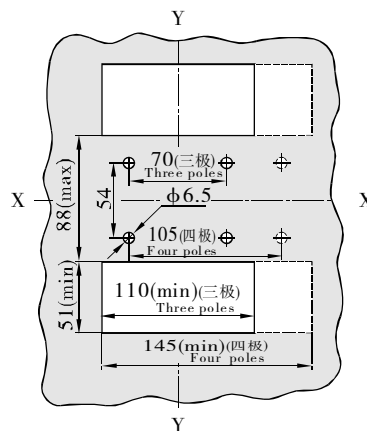
CM1L-225插入式板后接线（三极、四极）

X-X、Y-Y为三极断路器中心



Plug-in rear connected(three/four poles)

X-X、Y-Y as the center of three poles breaker



插入式板后接线安装板开孔尺寸

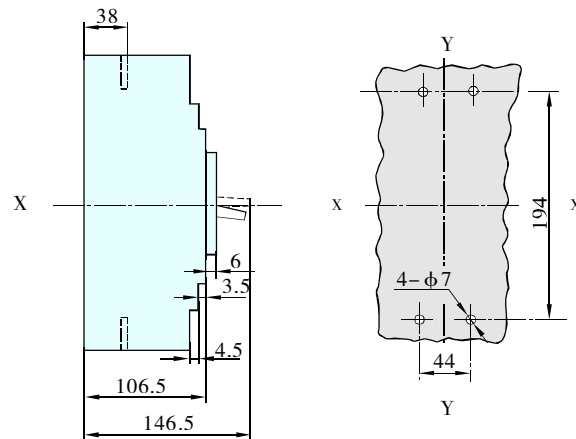
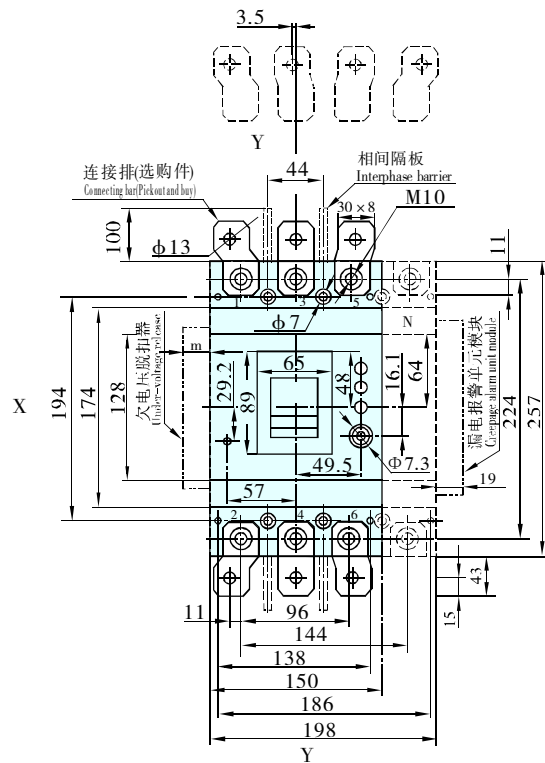
Mounting plate cutout dimensions of plug-in rear connected



外形尺寸及安装尺寸 OUTLINE DIMENSIONS AND MOUNTING DIMENSIONS

CM1L-400板前接线（三极、四极）
X-X、Y-Y为三极断路器中心

Front connected(three/four poles)
X-X、Y-Y as the center of three poles breaker

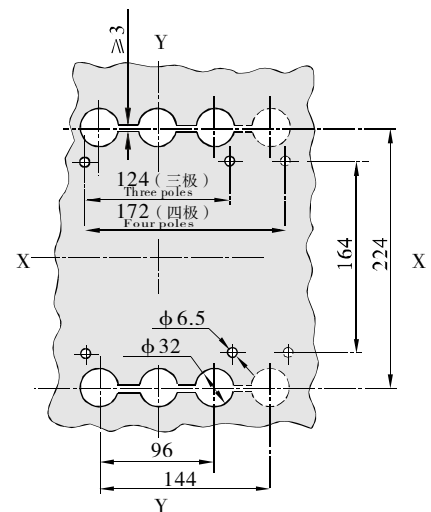
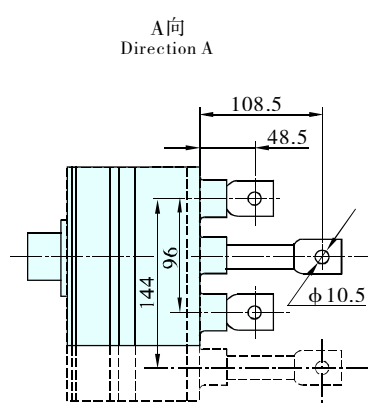
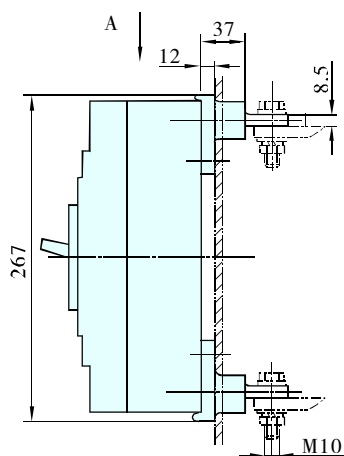


板前接线安装板开孔尺寸
Mounting plate cutout dimensions of front connected

欠电压脱扣器厚度:
C型 m=21
The thickness of under-voltage
release: type C m=21

CM1L-400板后接线（三极、四极）
X-X、Y-Y为三极断路器中心

Rear connected (three/four poles)
X-X、Y-Y as the center of three poles breaker

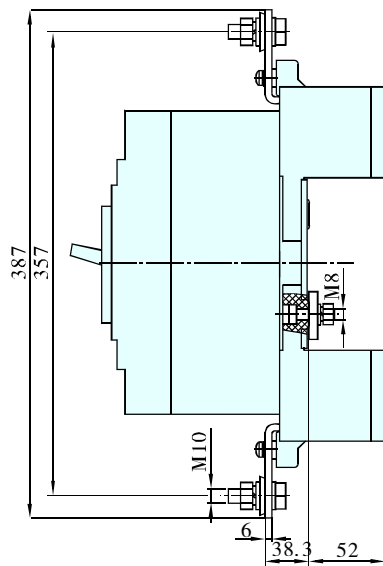


板后接线安装板开孔尺寸
Mounting plate cutout dimensions of rear connected

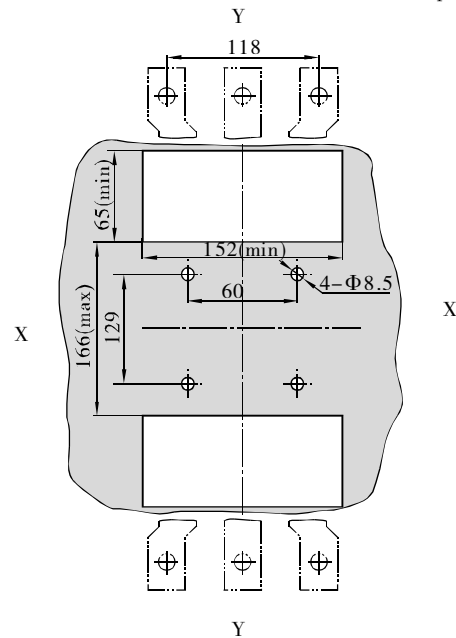


外形尺寸及安装尺寸 OUTLINE DIMENSIONS AND MOUNTING DIMENSIONS

CM1L-400插入式板前接线（三极）
X-X、Y-Y为三极断路器中心

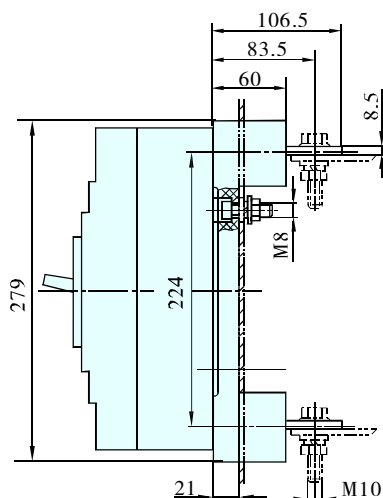


Plug-in front connected (three poles)
X-X、Y-Y as the center of three poles breaker

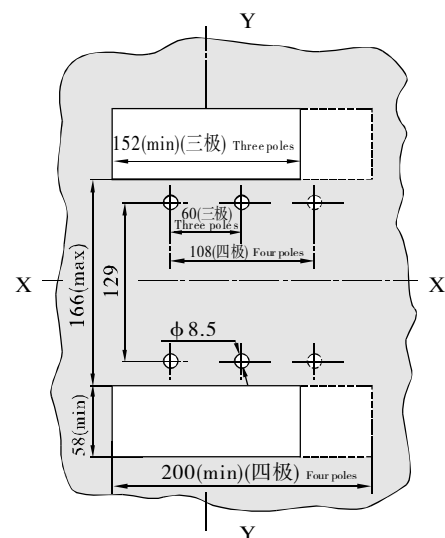


插入式板前接线安装板开孔尺寸
Mounting plate cutout dimensions of plug-in front connected

CM1L-400插入式板后接线（三极、四极）
X-X、Y-Y为三极断路器中心



Plug-in rear connected (three/four poles)
X-X、Y-Y as the center of three poles breaker



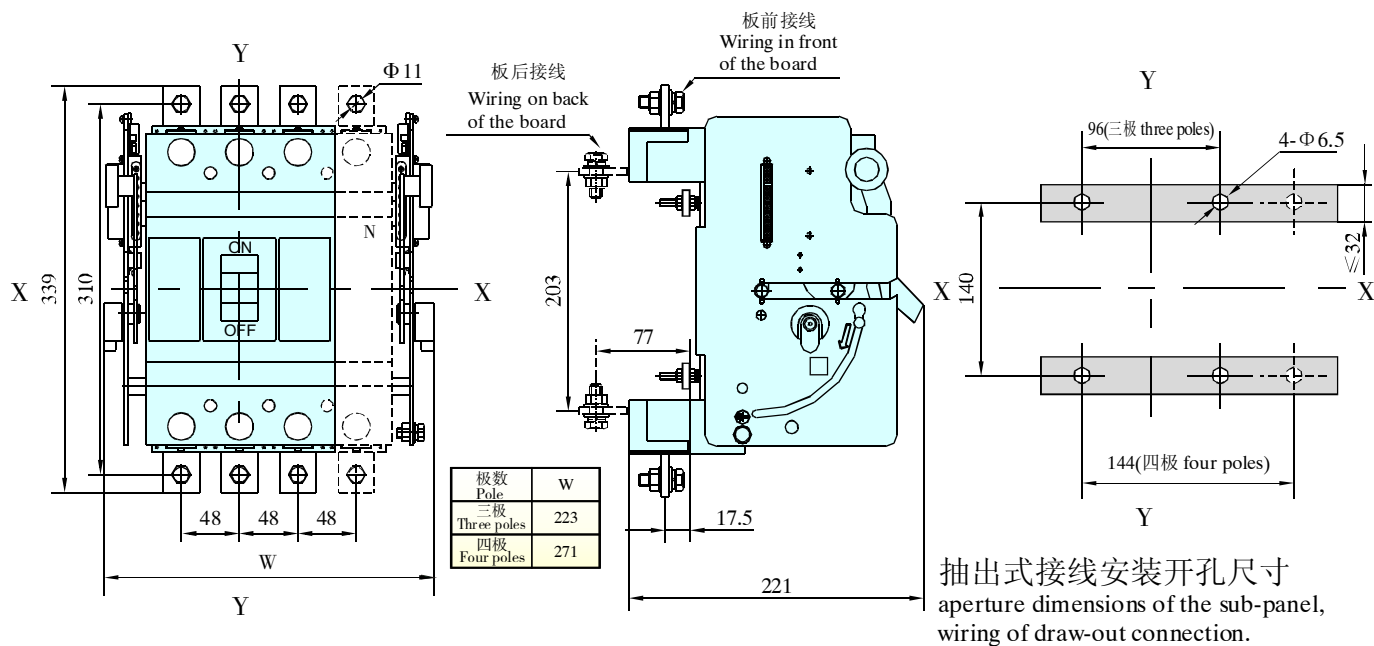
插入式板后接线安装板开孔尺寸
Mounting plate cutout dimensions of plug-in rear connected



外形尺寸及安装尺寸 OUTLINE DIMENSIONS AND MOUNTING DIMENSIONS

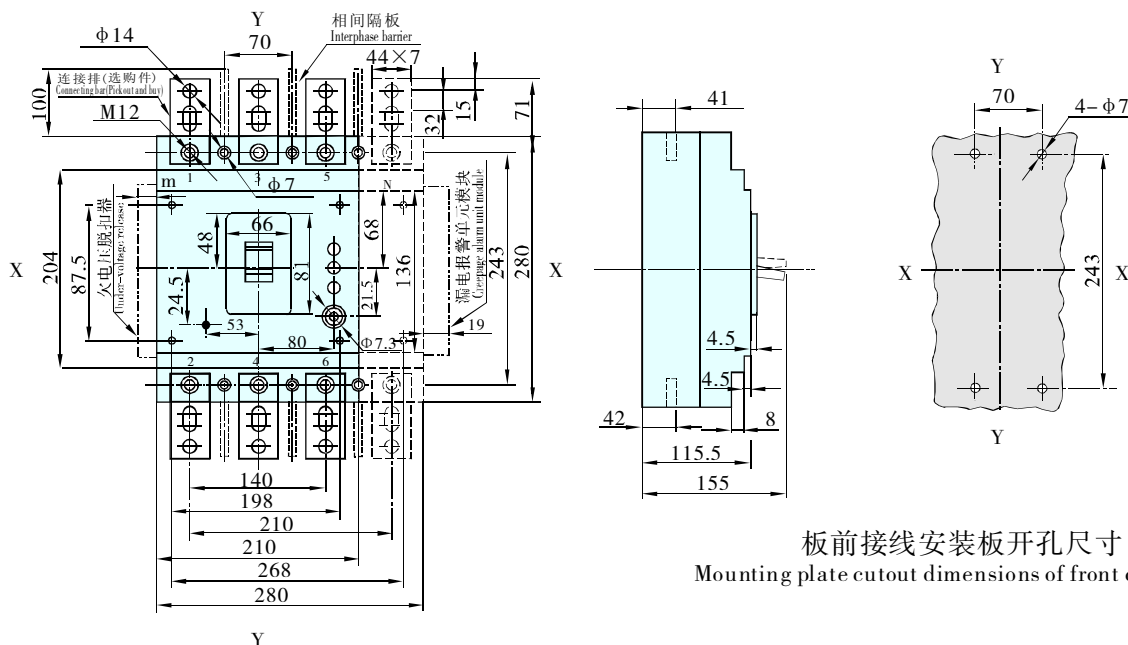
CM1L-400抽出式接线（三极、四极）
X-X、Y-Y为三极断路器中心

Draw-out connected (three/four poles)
X-X、Y-Y center for three poles breaker



CM1L-630板前接线（三极、四极）
X-X、Y-Y为三极断路器中心

Front connected (three/four poles)
X-X、Y-Y as the center of three poles breaker



欠电压脱扣器厚度:

C型 $m=0$

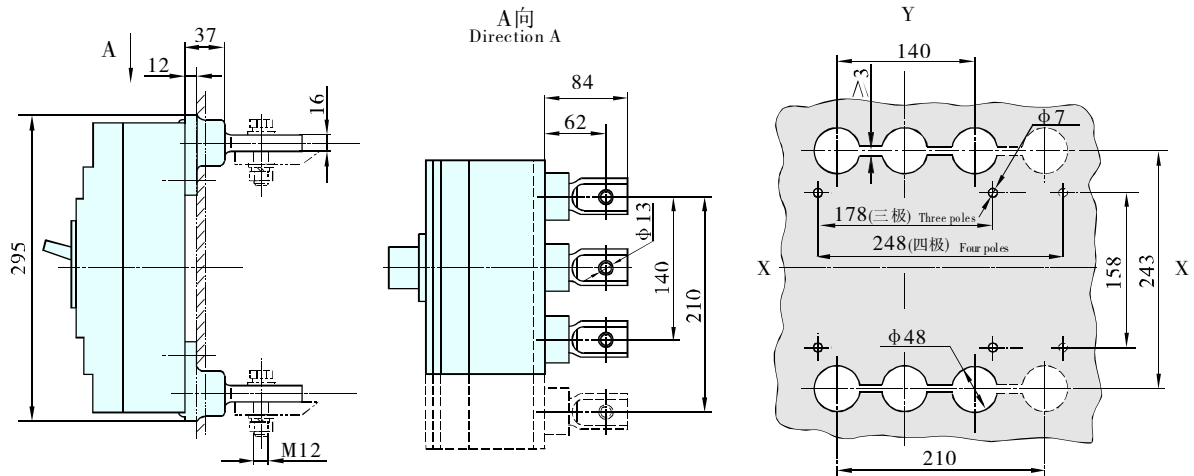
The thickness of under-voltage
release type C $m=0$



外形尺寸及安装尺寸 OUTLINE DIMENSIONS AND MOUNTING DIMENSIONS

CM1L-630板后接线（三极、四极）
X-X、Y-Y为三极断路器中心

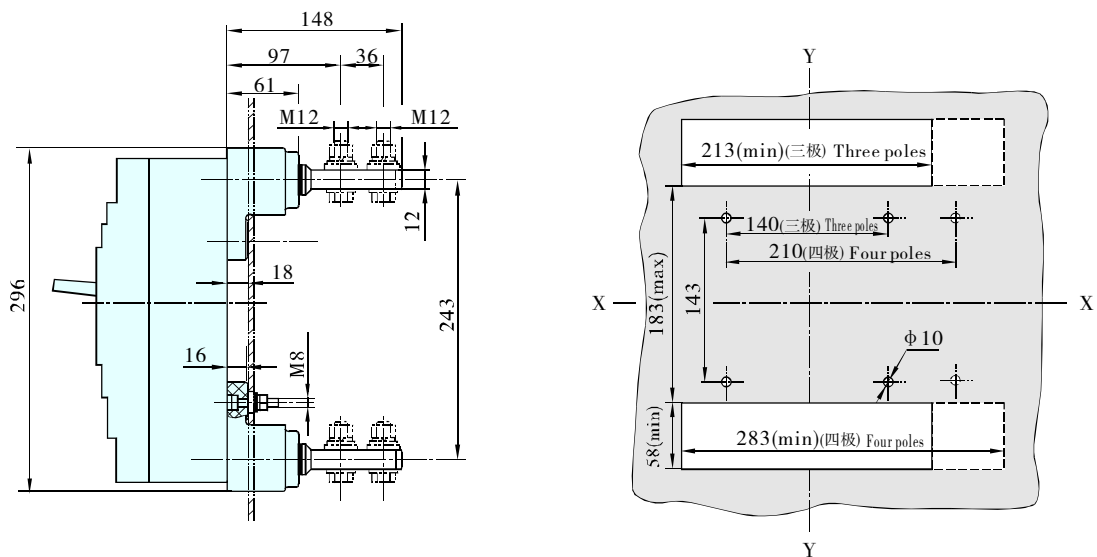
Rear connected (three/four poles)
X-X、Y-Y as the center of three poles breaker



板后接线安装板开孔尺寸
Mounting plate cutout dimensions of rear connected

CM1L-630插入式板后接线（三极、四极）
X-X、Y-Y为三极断路器中心

Plug-in rear connected (three/four poles)
X-X、Y-Y as the center of three poles breaker



插入式板后接线安装板开孔尺寸
Mounting plate cutout dimensions of plug-in rear connected

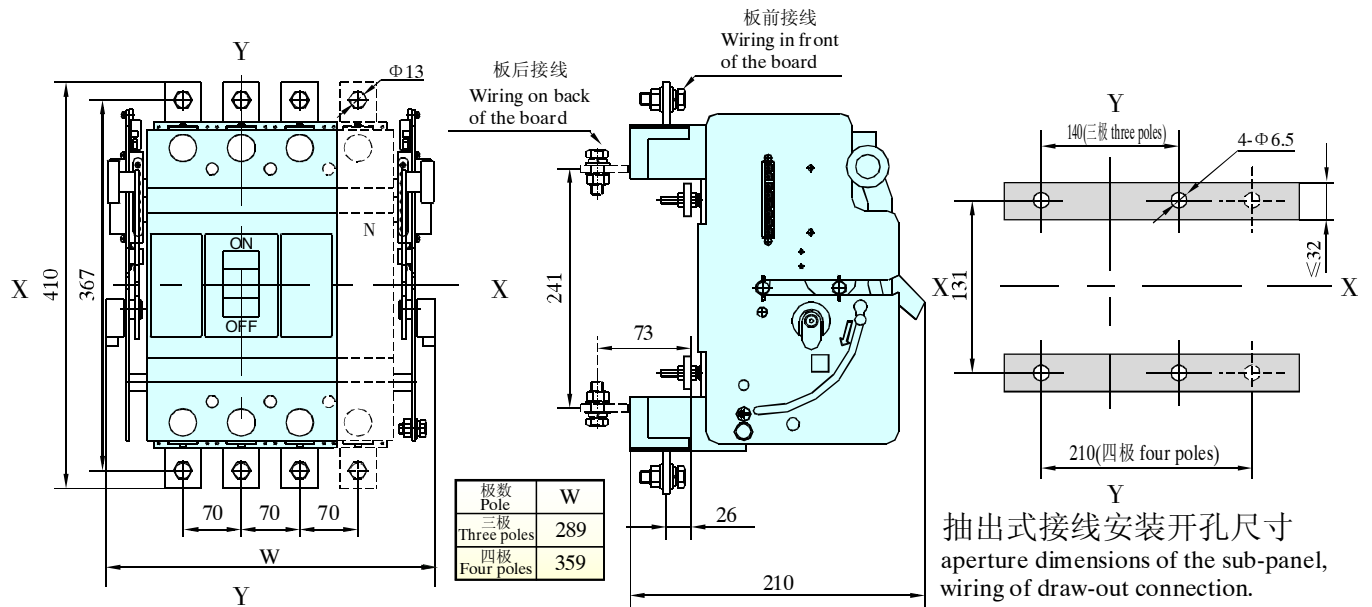


外形尺寸及安装尺寸 OUTLINE DIMENSIONS AND MOUNTING DIMENSIONS

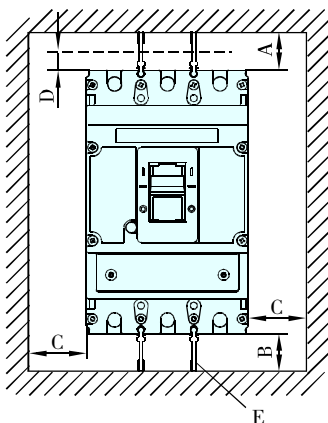
CM1L-630抽出式接线（三极、四极）draw-out connected（three /four poles）

X-X、Y-Y为三极断路器中心

X-X-Y-Y center for three poles breaker



断路器安装安全间隙 MOUNTING SAFETY CLEARANCE



A: 到导电回路（包括无遮挡物或有接地金属）

B: 断路器端子到底墙

C: 断路器侧部到侧墙（包括无遮挡物或有接地金属）

D: 到非导电部件

注: E为相间隔板, 必须安装。

A: To conductive circuit (including without shelter or with earthed metals)

B: The terminals of the circuit breaker to the bottom wall

C: The side case of the circuit (breaker to the side wall (including without shelter or with earthed metals)

D: To non-conductive units

Note: E, the interphase barrier, should be installed

单位: mm
Measurement

型 号 Type	A		B	C	D
	不需零飞弧罩 without zero arcing cover	带零飞弧罩 with zero arcing cover			
CM1L-100	50	25	25	25	25
CM1L-225	50	25	25	25	25
CM1L-400	100	25	25	25	25
CM1L-630	100	—	25	25	25

注: CM1L-100、225、400必须安装相间隔板或零飞弧罩, 可选择。

Note: The interphase barriers or zero arcing covers should be installed, may be selected.



1. 断路器的内部附件

根据用户需要断路器附件可直接导线引出（导线长度为50cm，有特殊要求订货时说明），或加装接线端子排。

● 欠电压脱扣器，符号○

欠电压脱扣器为C型：AC50Hz/60Hz 230V、400V。

外挂欠电压模块接线图

(虚框内为断路器内部附件接线图)

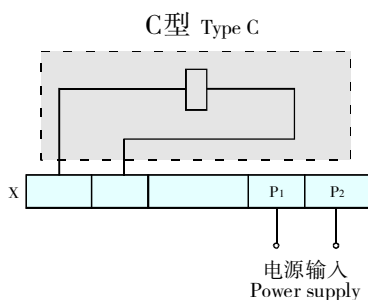
1.The internal accessories of the breaker

According to user's demands, accessories could lead to direct wire outcoming or flat terminals could be added.

Under-voltage release

type C for under-voltage release: AC50Hz/60Hz 230V, 400V

Wiring diagram of the under-voltage module connected externally (inner accessories are indicated in the dotted square)



符号说明：X为接线端子排
Code description: "X" stands for flat terminals

欠电压脱扣器功率见表
Power of the under-voltage release see Table

欠电压脱扣器型号 Under-voltage release type	配用断路器 Fitting breaker	安装位置 Mounting position	欠电压脱扣器功率(VA) Power of the under-voltage release	
			AC230V	AC400V
QTCM1L-100Z	CM1L-100 三极、四极 three/four poles	左面 left	2.6	3.3
QTCM1L-225Z	CM1L-225 三极、四极 three/four poles	左面 left	3.8	3.3
QTCM1L-400Z	CM1L-400 三极、四极 three/four poles	左面 left	3.7	2.7
QTCM1L-630Z	CM1L-630 三极、四极 three/four poles	左面 left	2.5	2.8

在额定控制电源电压的35%~70%时,欠电压脱扣器应可靠使断路器脱扣;

在额定控制电源电压的85%~110%时,欠电压脱扣器应保证断路器能合闸;

在额定控制电源电压低于35%时,欠电压脱扣器应防止断路器合闸。

Under the voltage of 35%~70% of the rated voltage, the under-voltage release should make the breaker trip correctly.

Under the voltage of 85%~110% of the rated voltage, the under-voltage release should make the breaker close reliably.

In case of the operation voltage less than 35% of the rated voltage, the under-voltage should prevent the breaker from closing.



敬告：欠电压脱扣器必须先通电，断路器才能再扣及合闸。否则将损坏断路器!

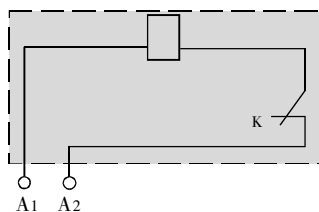
Warning: Only the under-voltage release energized in advance, the breaker could be recramped and closed, otherwise the breaker will be damaged.



● 分励脱扣器, 符号 ● Shunt release

接线图 (虚框内为断路器内部附件) Scheme of wiring(the internal accessories in the dotted frame)

分励脱扣器型号 Shunt release type	配用断路器 Fitting breaker	安装位置 Mounting position
FTCM1L-100Z	CM1L-100 三极 three poles, 四极A、B、C、D型 type A、B、C、D of four poles	左面left
FTCM1L-100YS	CM1L-100 四极B、C型 type A、B、C、D of four poles	右面right
FTCM1L-225Z	CM1L-225 三极 three poles, 四极A、B、C、D型 type A、B、C、D of four poles	左面left
FTCM1L-225YS	CM1L-225 四极B、C型 type A、B、C、D of four poles	右面right
FTCM1-400Z	CM1L-400 三极 three poles, 四极A、B、C、D型 type A、B、C、D of four poles	左面left
FTCM1-400Y	CM1L-400 四极B、C型 type A、B、C、D of four poles	右面right
FTCM1L-630Z	CM1L-630 三极 three poles, 四极A、B、C、D型 type A、B、C、D of four poles	左面left
FTCM1L-630Y	CM1L-630 四极B、C型 type A、B、C、D of four poles	右面right



电源输入 power supply

K: 分励脱扣器内部与线圈串联的微动开关为常闭触头, 当断路器分闸后, 该触头自行断开, 合闸时闭合
“K” is the slow motion switch normal-close contact conneted the coil in series in the shunt release.It turns-on or turns-off voluntarily as soon as the breaker on or off.

电压规格: AC50Hz/60Hz 230V、400V; DC220V、24V。Voltage rating: AC50Hz/60Hz 230V or 400V;DC220V or 24V.
在额定控制电源电压 U_s 的70 ~ 110%之间时, 分励脱扣器应可靠使断路器脱扣。
The shunt release should make the breaker trip reliably when the operation voltage is 70% ~ 110% of the rated control voltage.

注: 当额定控制电源电压为DC24V时, 有两种解决方案。

方案1, 采用DC24V分励脱扣器, 但应满足如下条件。铜导线最大长度(两根导线中每根长度)须满足下表条件, 脱扣器接线端处的电源功率须满足最小50W要求。

Note: While selecting DC24V voltage of the rated control power-supply, selecting two project.

Project1: Selecting DC24V release, but satisfy right table, and min-power capacity is 50W.

额定控制电源电压 U_s (DC24V) The rated control voltage	导线截面积 Wire area	1.5mm ²	2.5mm ²
100% U_s		150m	250m
85% U_s		100m	160m

方案2, 采用DC24V中间继电器控制AC230V或400V分励脱扣器, 中间继电器触点容量不小于1A。

Project2: Selecting the inter mediate relay of DC24V with 1A current capacity of its contactor.



- 漏电报警单元模块 Leakage alarm unit module
漏电报警单元模块有两种方式，用户根据需要可在订货时说明：
方式一(用 I 表示)：当发生漏电，漏电报警模块发出信号，同时断路器脱扣；
方式二（用 II 表示）：当发生漏电，漏电报警模块发出信号，但断路器不脱扣。
注：方式二是为满足特殊场合需要，用户在采用此功能保护电器时请慎重考虑。

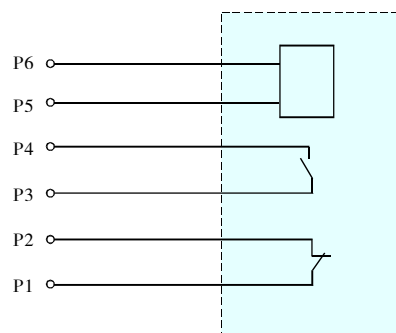
Creepage alarm unit module has two patterns users can illuminate when ordering.

Pattern one(as I):leakage alarm unit module send out signals when leakage,meanwhile the breaker release.

Pattern two(as II): leakage alarm unit module send out signals when leakage but the breaker don't release.

Note:Pattern two fits for special situation,please carefully consideration when using this protection electric products.

接线图（虚框内为漏电报警模块内部附件接线图）
Scheme of wiring (the internal accessories' wiring scheme of leakage alarm unit module in the dotted frame)

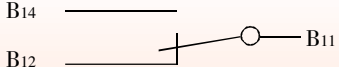


规格：P5-P6端输入电源为AC50Hz/60Hz 230V或400V。
P1-P2、P3-P4触头容量为AC230V 5A。

Specification:The input power supply of terminal P5-P6 is AC50Hz/60Hz 230V or 400V.

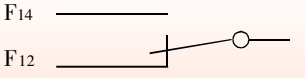
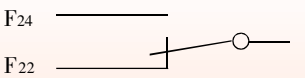
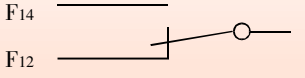
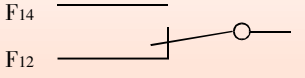
The contacts capacity of P1-P2 ,P3-P4 is AC230V 5A.

- 报警触头，符号□ Alarm Contact

报警触头型号 alarm contact type	配用断路器 Fitting breaker	安装位置 Mounting position	状态 status
BCCM1L-100Z	CM1L-100 三极、四极 three/four poles	左面 left	 图示为断路器处于“分”或“合”时的状态， The status of the breaker in “off” or “on”， 当断路器处于“脱扣”时，图示状态转换。 If breaker is “tripped”，the status is changovered.
BCCM1L-225Z	CM1L-225三极、四极 three/four poles	左面 left	
BCCM1-400Z	CM1L-400 三极、四极 three/four poles	左面 left	
BCCM1L-630Z	CM1L-630 三极、四极 three/four poles	左面 left	



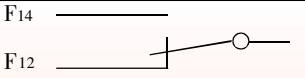
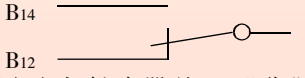
● 辅助触头, 符号 ■ Auxiliary Contact

触头型号 Auxiliary contact type	配用断路器 Fitting breaker	安装位置 Mounting position	状态 status
FCCM1L-100Z	CM1L-100 三极three poles, 四极A、B、C、D型type A、B、C、D of four poles	左面 left	 图示为断路器处于“分”或“脱扣”时的状态, 当断路器处于“合”时, 图示状态转换。 The status of breaker is “off” or “tripped”, if breaker is “on”, the status is changovered.
FCCM1L-225Z	CM1L-225 三极three poles, 四极A、B、C、D型type A、B、C、D of four poles	左面 left	
FCCM1L-100ZS	CM1L-100 三极three poles, 四极A、B、C、D型type A、B、C、D of four poles	左面 left	
FCCM1L-225ZS	CM1L-225 三极three poles, 四极A、B、C、D型type A、B、C、D of four poles	左面 left	
FCCM1-400ZS	CM1L-400 三极three poles, 四极A、B、C、D型type A、B、C、D of four poles	左面 left	 图示为断路器处于“分”或“脱扣”时的状态, 当断路器处于“合”时, 图示状态转换。 The status of breaker is “off” or “tripped”, if breaker is “on”, the status is changovered.
FCCM1-400YS	CM1L-400四极B、C型type B C of four poles	右面 right	
FCCM1L-630ZS	CM1L-630 三极three poles, 四极A、B、C、D型type A、B、C、D of four poles	左面 left	 图示为断路器处于“分”或“脱扣”时的状态, 当断路器处于“合”时, 图示状态转换。 The status of breaker is “off” or “tripped”, if breaker is “on”, the status is changovered.
FCCM1L-630YS	CM1L-630四极B、C型type B C of four poles	右面 right	

辅助触头、报警触头额定工作电流 Rated current operational of the auxiliary contact,alarm contact

分类 Type	壳架等级额定电流(A) Frame size rated current	约定发热电流I _{th} (A) Conventional thermal current	额定工作电流I _e (A) Rated operational current	
			AC400V	DC220V
辅助触头 Auxiliary contact	Inm ≤ 400	3	0.3	0.15
	Inm = 630	3	0.4	0.15
报警触头 Alarm contact	100 ≤ Inm ≤ 630	3	0.3	0.15

● 辅助触头+报警触头, 符号 □ Auxiliary and alarm contacts

辅助触头+报警触头型号 Auxiliary and alarm contact type	配用断路器 Fitting breaker	安装位置 Mounting position	状态 status
FBCM1L-100Z	CM1L-100 三极、四极 three/four poles	左面 left	 图示为断路器处于“分”或“脱扣”时的状态, 当断路器处于“合”时, 图示状态转换。 The status of breaker is “off” or “tripped”, if breaker is “on”, the status is changovered.
FBCM1L-225Z	CM1L-225 三极、四极 three/four poles	左面 left	
FBCM1-400Z	CM1L-400 三极、四极 three/four poles	左面 left	 图示为断路器处于“分”或“合”时的状态, The status of the breaker in “off” or “on”, 当断路器处于“脱扣”时, 图示状态转换。 If breaker is “tripped”, the status is changovered.
FBCM1L-630Z	CM1L-630 三极、四极 three/four poles	左面 left	

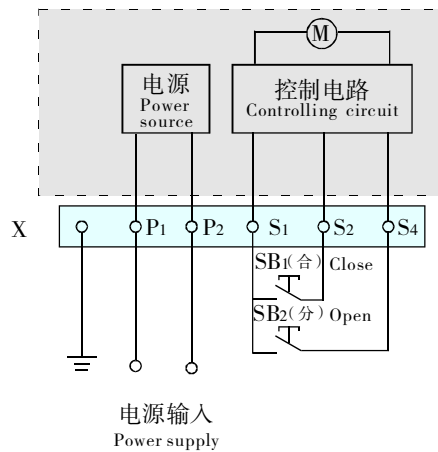


2、断路器的外部附件 The external accessories of the breaker

● DCCM1L 电动操作机构 DCCM1L motor operator

电动操作机构接线图（虚框内为电动操作机构内部接线图）

Wiring diagram of motor operator (Internal wiring diagram of motor operator in the dotted frame)



电压规格：AC 50Hz/60Hz 110V、230V
Voltage rating: DC24V、110V、220V

符号说明：

SB₁、SB₂ 操作按钮（用户自备）

X 接线端子排

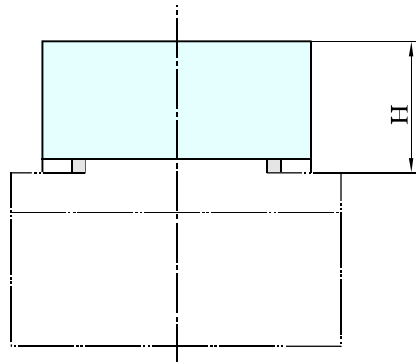
P₁、P₂ 为外接电源输入

Code description:

SB₁、SB₂ stand for push button (provided by users themselves)

P₁、P₂ stand for power supply.

电动操作机构相关参数 Parameter of motor operator





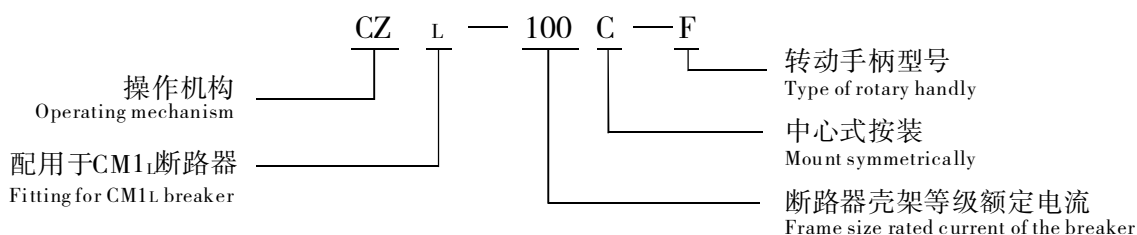
电动操作机构型号 Motor operator type	配用断路器 Fitting breaker	动作电流(A) Action current(A)	电机功率(VA) Motor Power(VA)	寿命(次) Durability(times)	H(mm)
DCCM1L-100	CM1L-100	≤ 0.5	14	20000	89.5
DCCM1L-225	CM1L-225	≤ 0.5	14	20000	93
DCCM1L-400	CM1L-400	≤ 2	35	10000	142
DCCM1L-630	CM1L-630	≤ 2	35	10000	146

注：断路器脱扣跳闸后，电动操作机构必须先使断路器再扣，然后才能合闸。

Note: Having released and tripped the breaker, motor operator should make the breaker recramped first, then it could be turned on.

● CZL手动操作机构 CZL rotary handle operator

型号含义： Type and its meaning



特点：

该操作机构采用独特的设计和传动结构，通过旋转手柄实现塑壳断路器的合闸、分闸和再扣。操作灵活、平稳，操作力小，安装方便，机构的整体性能和质量均优于其它同类产品。

用途：

本机构专用于CM1L系列塑壳断路器，通过旋转手柄实现抽屉柜、配电柜、动力箱等在面板上操作的要求，并保证断路器处于合闸时柜体门板不能开启（即与门联锁）。

Feature:

Adopting the unique design and transmitting structure, the operation mechanism can make the breaker close, open and recamp by turning the handle. Features of smooth and flexible operation, little force and convient mounting, performance and quality of the device is better than other similar products.

Usage:

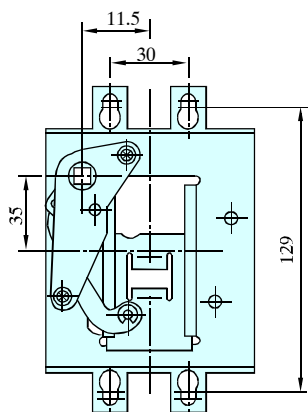
The mechanism is used specially in CM1L series moulded case breakers, to operate the draw-out panel, power distribution panel and power supply box outside the panel by turning the handle, and to ensure the door of panel would not be opened when the breaker being on (i.e. interlock with the door).



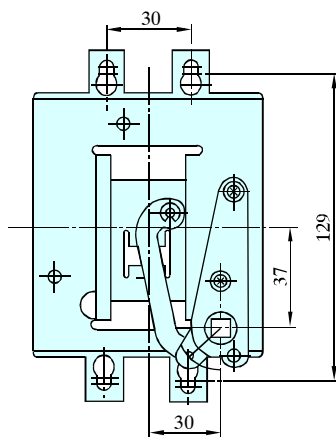
外形及尺寸：Outline and dimensions

● 配CM1L-100三极、四极的操作机构

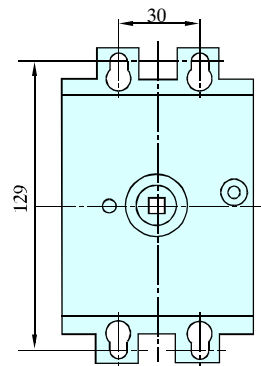
The operating mechanism of CM1L-100 three poles and four poles



CZL-100A



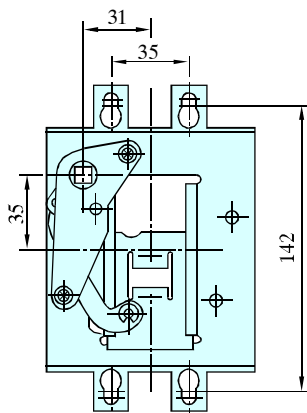
CZL-100B



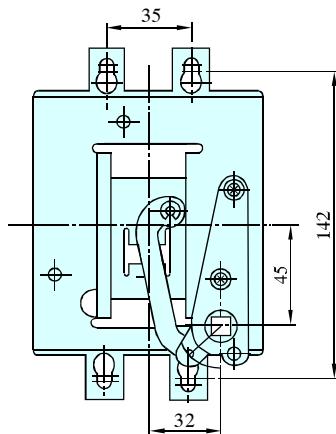
CZL-100C

● 配CM1L-225三极、四极的操作机构

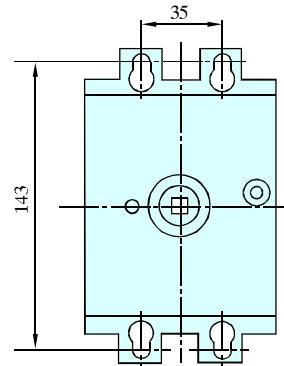
The operating mechanism of CM1L-225 three poles and four poles



CZ-225A



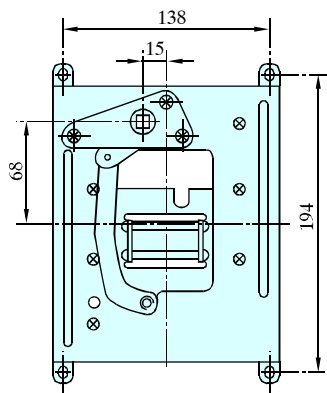
CZL-225B



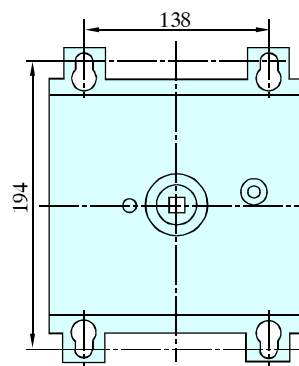
CZL-225C

● 配CM1L-400三极的操作机构

The operating mechanism of CM1L-400 three poles



CZL-400A

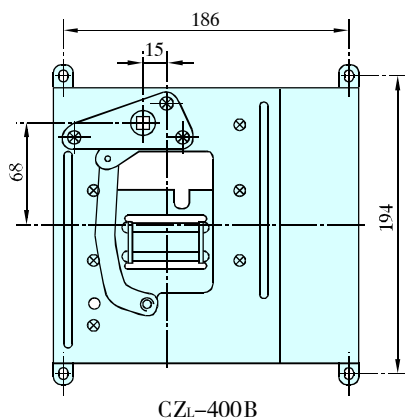


CZL-400C

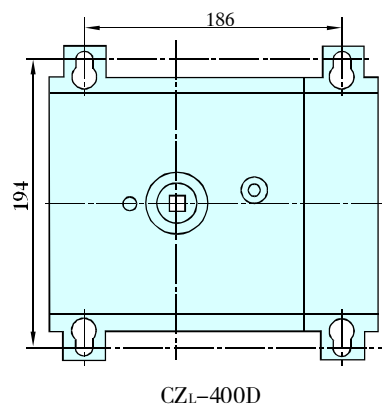


● 配CM1L-400四极的操作机构

The operating mechanism of CM1L-400 four poles



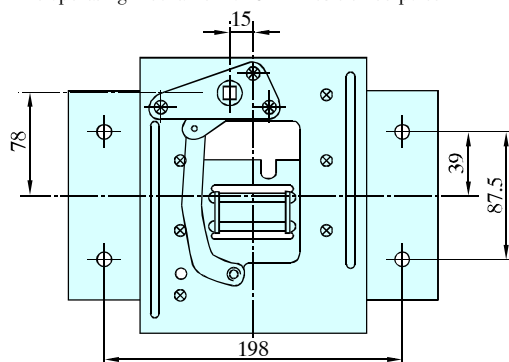
CZL-400B



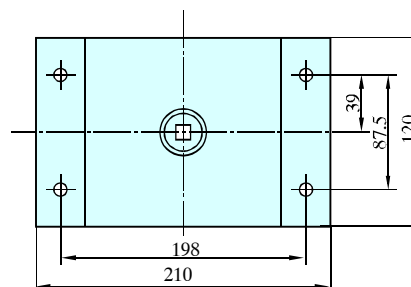
CZL-400D

● 配CM1L-630三极的操作机构

The operating mechanism of CM1L-630 three poles



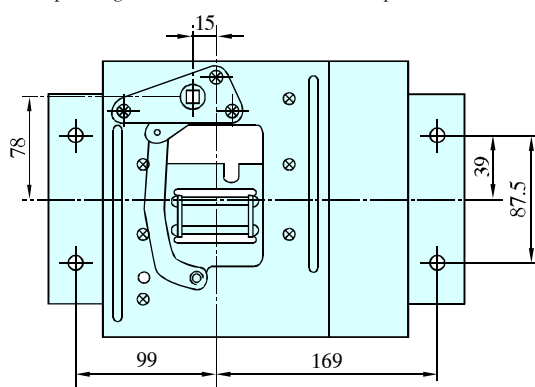
CZL-630A



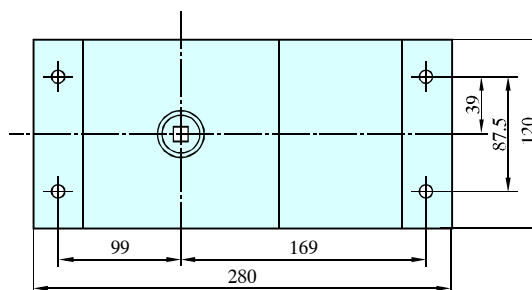
CZL-630C

● 配CM1L-630四极的操作机构

The operating mechanism of CM1L-630 four poles



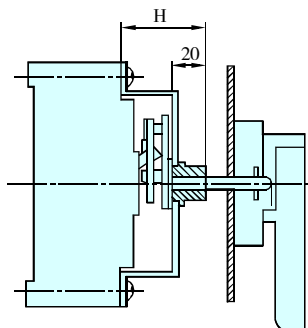
CZL-630B



CZL-630D



CZL系列操作机构高度 Height of the operating mechanism CZL type



操作机构型号 Type of operating mechanism	H (mm)
CZL-100A/CZL-100B/CZL-100C	45/45/49
CZL-225A/CZL-225B/CZL-225C	47/47/55
CZL-400A/CZL-400B/CZL-400C/CZL-400D	61/61/76/76
CZL-630A/CZL-630B/CZL-630C/CZL-630D	55/55/68/68

CZL操作机构可配用二种操作手柄：一种为“F”型方形手柄；另一种为“A”型圆形手柄，其门板开孔尺寸见下图。

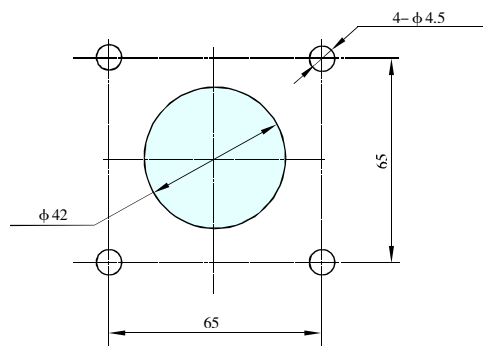
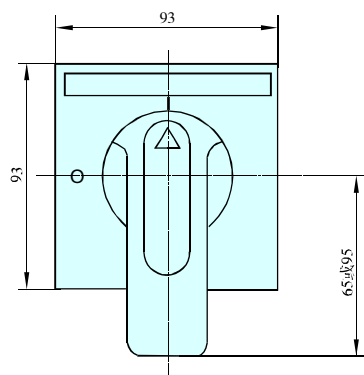
操作手柄特点：

1. 当断路器在合闸状态时，不能开启柜门；
2. 若操作手柄或操作机构在合闸状态时有故障，可通过操作手柄上的紧急解锁装置开启柜门；
3. 对应不同规格的操作机构，相配套的手操手柄，其门板开孔一致。

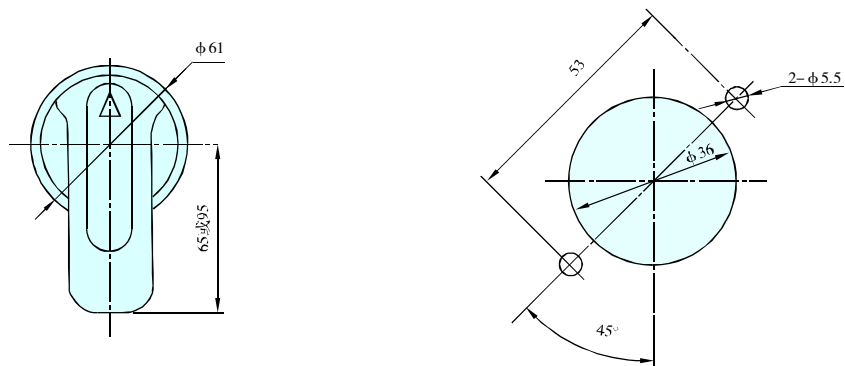
The operating mechanism can be equipped with two types of operation handles: one is model "F" square handle, the other is model "A" round handle. Aperture dimension on the panel sheet see the following drawings.

Characteristics of the operation handle:

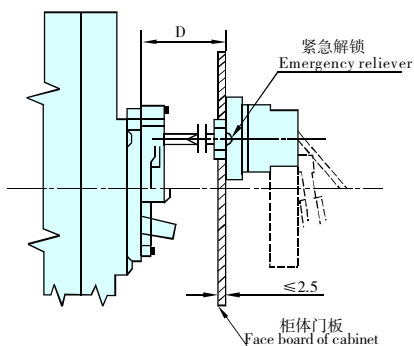
1. The panel door can't be opened when the breaker is closed.
2. If fault happens while the operation handle or hand-drive mechanism is closed, the panel door can be opened by operating the emergency reliever on the operation handle.
3. For the operation handle fitting hand-drive mechanism of different specifications, the aperture on the panel sheet should be same.



“F”型方形手柄外形及门板开孔尺寸（开孔中心离铰链距离不小于200mm）
Contour of model "F" square handle and the aperture dimension on the panel sheet
(distance from the aperture center to hinge of panel door isn't less than 200mm)



“A”型圆形手柄外形及门板开孔尺寸（开孔中心离铰链距离不小于200mm）
Contour of model "A" round handle and the aperture dimension on the panel sheet
(distance from the aperture center to hinge of the panel door isn't less than 200mm)



注：1.方轴长度D=150,长度大于150mm时，在订货时注明；

2.操作机构配用“F”型手柄，型号CZL加注“F”，如CZL-100C-F即可;配用“A”型手柄，型号CZL加注“A”，如CZL-100C-A。

Note:1.Length of the square axis(D) is 150mm. In case of the length is more than 150mm,please note while making orders.

2. While operating mechanism is equipped with model "F" handle,"F" would be put together with "CZL",for example written in "CZL-100C-F". While operation handle is equipped with the model "A" handle,"A" must be added,fox example written in "CZL-100C-A".

敬告用户:手动操作机构,必须向本公司配套订货以确保产品质量。如用户自行购买,安装装配后发生的一切不良后果本公司不负责任。

Advice to users:To insure the quility,rotary handly operator should be placed order with the company for complete set with the breaker.If bought by yourselves,and harmful effects took place after mounted,the company would be not responsible for it.



不同额定电流的连接导线参考截面

CROSS-SECTION WIRING CONDUCTOR
CORRESPONDING RATED CURRENT

额定电流值(A) Rated current	10	16、20	25	32	40、50	63	80	100	125、140	160	180、200、225	250	315、350	400
导线截面积(mm ²) Cross-section	2.5	2.5	4	6	10	16	25	35	50	70	95	120	185	240

额定电流值(A) Rated current	电缆 Cable		铜排 Copper bar	
	截面积(mm ²) Cross-section	数量 Amount	尺寸 (mm × mm) Size	数量 Amount
500	150	2	30 × 5	2
630	185	2	40 × 5	2

注：按GB14048标准，CM1L-100中额定电流10A采用1.5mm²导线连接满足温升要求。

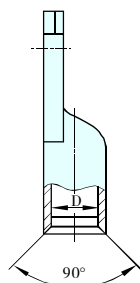
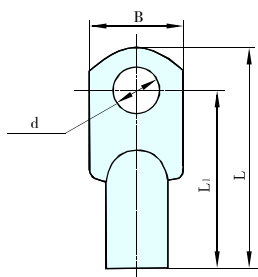
Note: Rated 10A by 1.5mm² cable connecting of CM1L-100 is complied temperature-rises of GB14048 standrad.



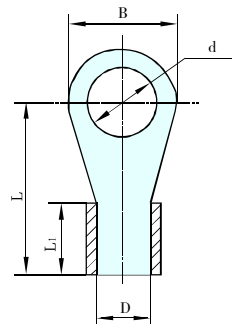
接线端子型号 TERMINAL TYPE

接线端子分JGC及JBC二种型号供用户选用

Two types of wiring terminals are supplied: JGC and JBC, chosen by users.



JGC型
JGC type



JBC型
JBC type



型号 Type	电流(A) Current	导线截面积(mm ²) Cross-section	端子型号 Type of Terminal	B	L	L ₁	D	d
CM1L-100	10、16、20	2.5	JBC2.5-8	15	24.5	8.5	φ 2.6	φ 8.2
	25	4	JBC4-8	13.4	20.4	9.2	φ 2.8	φ 8.2
	32	6	JBC6-8	15	24.5	10	φ 3.5	φ 8.2
	40、50	10	JBC10-8	15	24.5	11	φ 4.5	φ 8.2
	63	16	JGC16-8	12.5	41	33.5	φ 6	φ 8.2
	80	25	JGC25-8	14	46	38.5	φ 7	φ 8.2
	100	35	JGC35-8	15.5	52	44.5	φ 8	φ 8.2
CM1L-225	100	35	JGC35-8	15.5	52	44.5	φ 8	φ 8.2
	125、140	50	JGC50-8	17	54	45	φ 10	φ 8.2
	160	70	JGC70-8	21.6	61	52	φ 11	φ 8.2
	180、200、225	95	JGC95-8	22	66	57	φ 13	φ 8.2



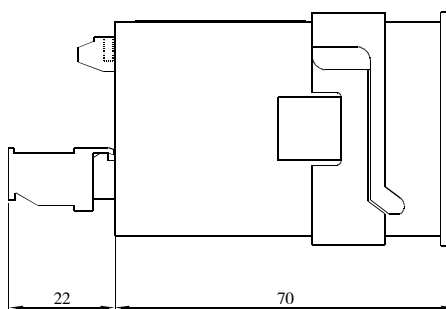
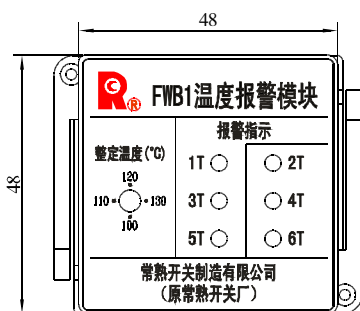
FWB1温度报警模块 TEMPERATURE ALARM MODULE

FWB1温度报警模块采用FRG热传感器直接安装在连接点位置在线检测温度，最多监测6路连接位置温度(热传感器连接至温度报警模块背面的输入端子分别为1T、2T、3T、4T、5T、6T)。当监测到连接点温度超过动作温度时，温度报警模块指示灯点亮发出相应报警指示，并且内置的继电器二路输出触头闭合（二路输出端子分别为13、14，23、24），可发出远方报警信号或使断路器跳闸；当监测到连接点温度降至复位温度时，温度报警模块指示灯熄灭并且二路输出触头断开。温度报警模块连接至热传感器的线长为1.5米。

FWB1 temperature alarm module adopts online temperature detection that the FRG heat sensor directly mounted on the connection position. It can detect at most six points connection position (the input terminals on the back of the temperature alarm module, which the heat sensor is connected to, are 1T、2T、3T、4T、5T、6T respectively). When detecting the temperature of the connection points is higher than action temperature, the temperature alarm module's directive lights are on and alarming, at that time, the inbuilt relay's 2nd output contact will make (the 2nd output terminals are 13、14, 23、24 respectively); when detecting the connection temperature dropping to resetting temperature, the temperature alarm module's directive lights are off and the 2nd output contact will break. The connection wire between the temperature alarm module and the heat sensor is of 1.5m length.

测温范围 temperature detection range	0~150℃
动作温度To action temperature	100/110/120/130℃
复位温度Tr resetting temperature	To-5℃
精度 precision	± 5℃
传感器绝缘耐压 sensor insulation withstand voltage	AC3500V/1min
测温点数 temperature detection points	最多6路 6 points at most
工作电源 operatiing current	AC230V，范围range195~253V
输出触头容量 output contace capacity	3A/AC250V，3A/DC24V
工作温度 operating temperature	-20℃~+70℃

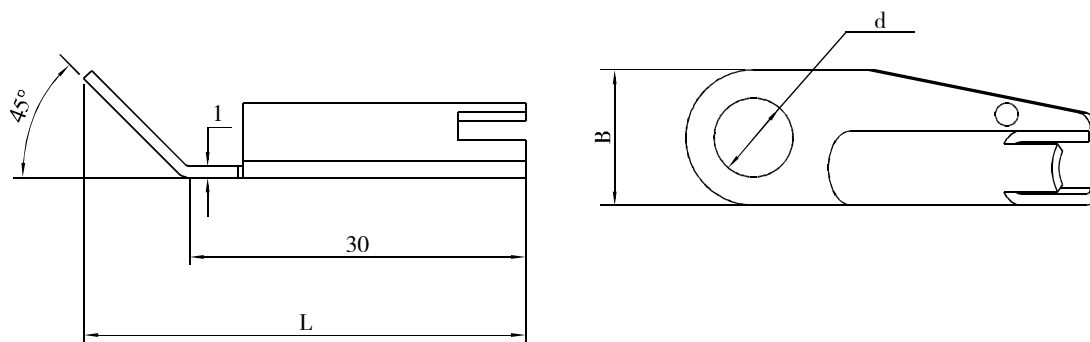
- FWB1温度报警模块+FRG热传感器 FWB1 temperature alarm module+FRG heat sensor



FWB1温度报警模块
Temperature alarm module



FWB1温度报警模块 TEMPERATURE ALARM MODULE



FRG热传感器
Heat sensor

热传感器型号 heat sensor type	B (mm)	L (mm)	d (mm)
FRG-7	12	40	φ7
FRG-9	14	41	φ9
FRG-11	16	42	φ11
FRG-13	18	44	φ13
FRG-17	22	47	φ17



注意事项 MATTERS NEEDING ATTENTION

- 断路器各种特性由制造厂整定，用户在使用中不可随意调整；
- 断路器的额定剩余动作电流、剩余电流动作时间（非延时和延时），用户可根据实际需要进行调整(专业人员进行)；
- 在主电路通电状态下，对额定剩余动作时间为非延时的断路器，手按模拟剩余电流动作试验按钮应立即脱扣。对延时的断路器，手按试验按钮且保持所调的延时时间值，断路器才脱扣；
- 断路器漏电脱扣后，面板上漏电指示按钮向外凸出；
- 带漏电报警单元模块的断路器，当发生漏电报警后，必须对模块上的复位按钮进行复位，断路器漏电保护模块才能正常工作。

- All the performance of the breaker have been set by the company,and it could not be adjusted arbitrarily in use.
- The rated residual operating current and residual current operating time (undelay and delay) of the breakers can be adjusted by the users according to actual needs(operated by professionals).
- As the main circuit is energized,For the rated residual operating time of undelayed of the breaker,Press the button of simulating residual current working test should release immediately.For the delayed breaker,only while,press the test button and remain the adjusted delay time value,the breaker could release.
- After the breaker released due to creepage,the creepage indicating button on the panel should be out-protrude.
- The breaker with creepage alarm unit module must reset the return button when creepage alarmed,and the creepage protection module of the breaker can work as normal.



订 货 须 知 ORDERING NOTICE

(一) 用户务必确认对本产品技术资料已有详细了解, 并应根据断路器将来使用的场合, 按“订货规范”表订货。

(二) 如用户订货时对剩余电流保护参数不作要求, 本公司按“剩余电流保护出厂整定值”表配置。

(三) 三相四线 400V/230V 或单相与三相共用的线路, 应选用四极断路器。

(四) 建筑物内实施等电位联结的 TN-C-S 和 TN-S 系统, 且不在电源转换处的 CM1L 四极断路器, 中性极形式推荐采用 A 型或 D 型。

Users should make sure of their detailed acquaintance of the products' technological materials and make order by the ordering notice in terms of future applicable situations of the circuit breakers.

The company would configure by "Factory" s setting values of residual current protection" if users had no requirements of protection parameters of residual current when making order.

Four poles breakers for the share wire of three-phase four-wire 400V/230V or single phase and three-phase.

The neutral pole type of CM1L four-pole circuit breaker which used in equal potential TN-C-S and TN-S system and not installed power supply changeover place is recommended to adopt type A or type D.

订 货 规 范

Ordering from

(请在 ___ 内填上数值, □ 内打√)

Please fill figures in ___, mark √ in □

用户单位 Name			订货总数 Order Amount			订货日期 Date		
规 格 Specification	配电型 Power distribution	CM1L - _____ / _____ ,	In= _____ A,	10In (10A ≤ In ≤ 630A)	5In □ (140A ≤ In ≤ 630A)			
	电动机保护型 Motor protection	CM1L - _____ / _____ ,	In= _____ A,	12In (10A ≤ In ≤ 630A)				
连 接 Wiring	板前接线 □ 板后接线 □ 插入式板前接线 □ 插入式板后接线 □ 抽出式板前接线 □ 抽出式板后接线 □ Front connected Rear connected Plug-in front connected Plug-in rear connected Draw-out front connected Draw-out rear connected							
相对应剩余电流 脱扣器型式的额 定剩余动作电流 I _{Δn} The corresponding rated residual operating current I _{Δn} of the residual current release pattern	U型 (非延时) Type U(non-time-delay)	0.03A □ 0.1A □ 0.3A □ 0.5A □ (对CM1L-100、CM1L-225)						
	V型 (非延时、 延时可调) (标准型) Type V(non-time-delay, time-delay adjustable) (typical type)	0.1A □ 0.3A □ 0.5A □ (对CM1L-100、CM1L-225、CM1L-400)						
		0.3A □ 0.5A □ 1A □ (对CM1L-630)						
	W型 (非延时、 延时可调) Type W(non-time-delay, time-delay adjustable)	0.3A □ 1A □ 3A □ 10A □ (对CM1L-100、CM1L-225)						
		1A □ 3A □ 10A □ 30A □ (对CM1L-400、CM1L-630)						
	VA型 (非延时、 延时可调) Type VA(non-time-delay, time-delay adjustable)	0.1A □ 0.3A □ 0.5A □ (对CM1L-100、CM1L-225、CM1L-400)						
剩余电流动作时间 Rated residual current operating time	非延时 Non-time-delay	□						
	延时 Time-delay	2I _{Δn} 时极限不驱动时间 Δt Maximum break time of Δt	0.1s □		0.5s □		1s □	
		5I _{Δn} 时最大断开时间 Maximum break time of 5I _{Δn}	0.25s		0.9s		1.9s	
		相对应I _{Δn} 时最大断开时间 Maximum break time corresponds with I _{Δn}	0.5s		1.15s		2.15s	
		相对应2I _{Δn} 时最大断开时间 Maximum break time corresponds with 2I _{Δn}	0.35s		1s		2s	
附 件 Accessories	分励脱扣器 Shunt release	AC400V □ AC230V □ DC220V □ DC24V □						
	欠电压脱扣器 Under-voltage release	C型	AC230V □ AC400V □					
	漏电报警单元模块 Leakage alarm unit module	AC230V □ AC400V □						
	电动操作机构 Motor operator	AC230V □ AC110V □ DC220V □ DC110V □ DC24V □						
	手动操作机构 Rotary handle operator	CZL-F □ CZL-A □						
	连接排 □ Connecting bar	零飞弧罩 □ (仅CM1L-100、225、400具有) Zerd arcing cover (only for CM1L-100、225、400)						
	FWB1温度报警模块 □ 和 Temperature alarm module	热传感器型号Type	FRG-7	FRG-9	FRG-13	FRG-11	FRG-17	
备 注 Note	V型剩余电流脱扣器为标准型, 订货时不必注明。 Type V residual release is standard type, it's unnecessary to note while ordering.							



剩余电流保护出厂整定值

Factory's setting values of residual current protection

型 号 Type		CM1L-100	CM1L-225	CM1L-400	CM1L-630
相对应剩余电流 脱扣器型式的额 定剩余动作电流 $I_{\Delta n}$ The corresponding rated residual operating current of the residual current release pattern	U型 Type U	0.03A	0.03A	——	——
	V型 Type V	0.1A	0.1A	0.1A	0.3A
	W型 Type W	0.3A	0.3A	1A	1A
	VA型 Type VA	0.1A	0.1A	0.1A	0.3A
额定剩余动作时间 Rated residual operating time	非延时 Non-time-delay			延时, $5I_{\Delta n}$ 时最大断开时间 0.25s time-delay,maximum break time of $5I_{\Delta n}$ is 0.25s	

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
上海森昊电器有限公司 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

合肥恒祥电气设备安装有限公司 0551-6393319

江苏

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南京苏能动力工程设计有限公司 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
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南通正源电气有限公司 0513-85030391
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常熟市中通电力设备有限责任公司 0512-52853511
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2011.12

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