微型热保护器领导者

Leader of Micro Thermal Protector

SAFTTY
OVERHEAT UNDER CONTROL

SAFTTY ELECTRONIC TECHNOLOGY
安的電子

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www.thermalprotector.cn

RoHS ISO9001:2008

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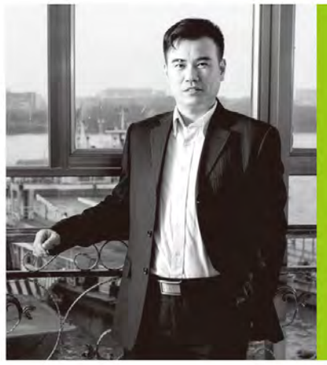


安的理念

持续创新，持续改进，
是安的品牌灵魂所在。

Creating and improving everyday

安的电子总经理
General Manager

**安的坚持走自主研发、自主生产制造之路、
已取得十多项国家发明专利**

安的秉持创新发展理念，通过结构设计、原材料使用、新技术引用等，打破了国外企业对一些高端产品的垄断，以每年研发两到三款新产品，形成产品的多元化和系列化；安的自成立以来已取得十多项国家发明专利，成为国家技术标准委员会委员企业。

安的坚持营销创新，和欧美等国顶尖企业达成战略协作

安的坚持营销创新，是行业内第一批出口企业，产品远销美国、德国、意大利、巴西、土耳其、印度等国家和地区。安的积极同美国第一大缓动式保护器制造企业PEPI达成战略合作协议，利用PEPI在美国花了五十年时间建立起的强大的经销商渠道销售安的产品。安的也同欧洲最大的行业分销商合作，把产品顺利带给欧洲客户。近年，安的还积极开拓巴西、土耳其、印度等新兴市场，使得安的品牌在全球拥有较高的知名度和影响力。在销售制度创新上，我们采取毛利润分成，高价高提成比例，销售部内部承包的模式创新，提高销售队伍的积极性。安的成立了电子在线商学院，编写保护器行业销售大全葵花宝典，组织公司营销人员专业培训，打造高效的营销队伍。

建立质量标准控制体系，确保安的产品可靠性和一致性

持续改进是我们对产品品质和可靠性的一贯追求。没有最好，只有更好是我们的价值观。我们通过建立质量标准控制体系，通过产品设计、供应商选择、原材料零部件使用标准制定、组装可靠性、失效模式分析、体系文档控制等方式，提高产品的可靠性和一致性。产品的失效率从百万之五百提高到百万分之一百五。

做值得社会信赖的温控企业

热保护器是安全类元器件，做优质的安全元器件就是安的义不容辞的社会责任。做最强最值得信赖的温控企业就是安的的企业使命。外国的月亮并不比中国的圆，安的电子凭借国人的支持和自身的努力，得到了许多全球电子行业领袖的认可，已具备了与国外同行一争高低的实力；使用中国本土企业的产品，环节少，产品易于追溯，可降低客户的使用风险，购买国产品牌产品，更是以实际行动支持民族工业，为中国梦尽一份力。

Saftty insists on the independent research and development, and we have been patented more than 10 national inventions.

Upholding the idea of development and innovation and through structural design, raw material, new technology, Saftty has broken down the monopoly of foreign enterprises in some high-end products and develops 2 to 3 new models products each year.Saftty has been patented more than 10 national inventions since foundation and become a member of National Technical Standards Committee.

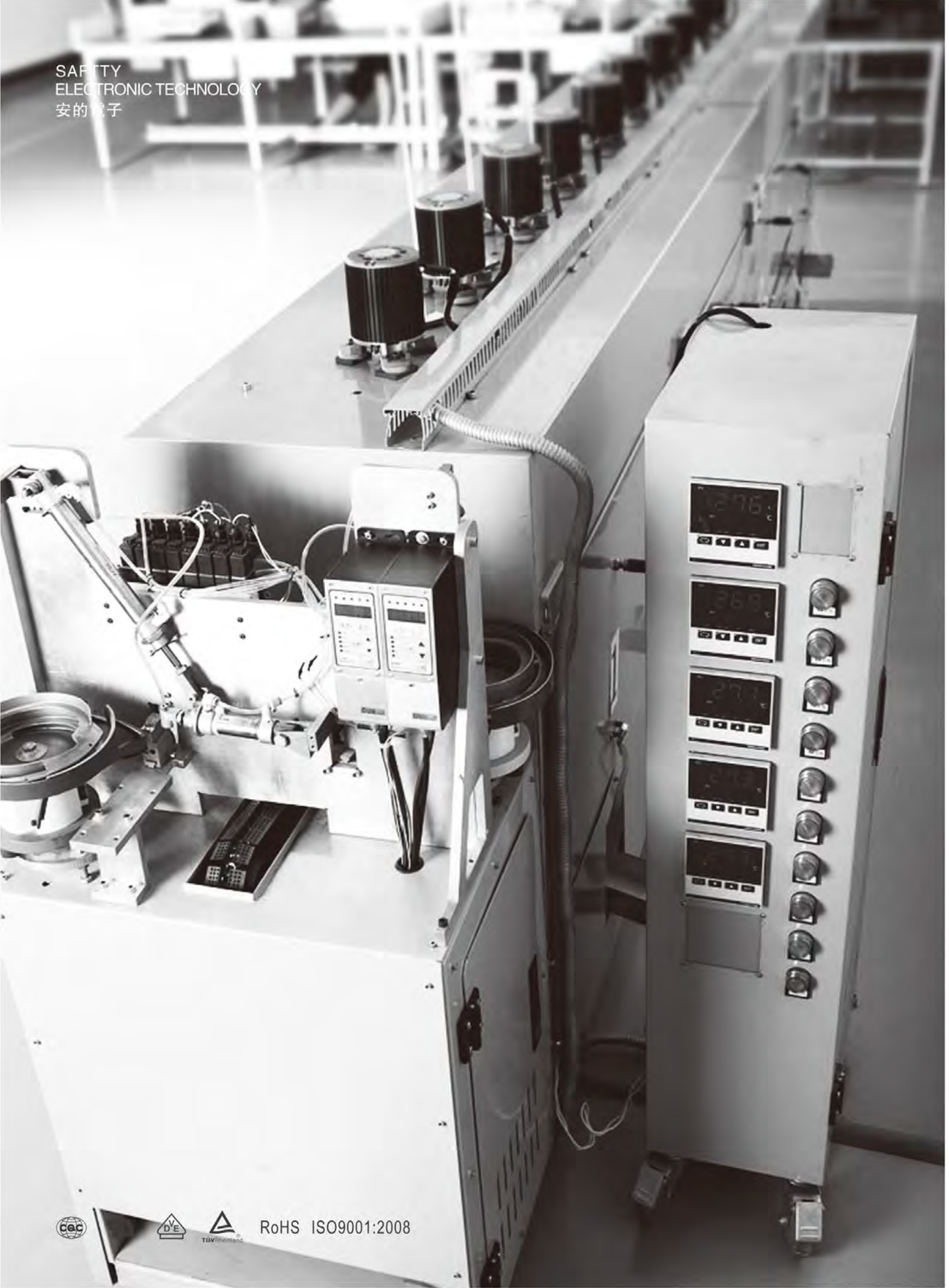
Saftty insists on marketing innovation and has cooperated with top companies in Europe and America.

Saftty insists on marketing innovation and we are one of the first export profession companies. Our products are exported to the United States, Germany, Italy, Brazil, Turkey, India and many other countries and regions. Saftty and PEPI who is the world's largest creep-action thermostat manufacturer, have come to a strategic cooperation agreement that through PEPI's powerful distribution channel which has been built for 50 years in the United States to distribute our products. We have made cooperation with Europe's largest distributor who introduces our products to European customers. In recent years, we also actively focus on emerging markets such as Brazil, Turkey and India. Saftty brand has a good visibility and influence in the world.

Building up quality control system to ensure product reliability and consistency.

Continuous improvement is our relentless pursuit for perfect product quality and reliability. "Let's make things better" is our core value concept. Through establishment of the quality control system, the product design, the choice of suppliers, raw materials and spare parts using standard formulation, assembly reliability, failure mode analysis, the system document control, we can assure the high reliability and consistency of the product. Product failure rate decreases from 500ppm to 150ppm

Focus on temperature control area，to be trust！



安的简介 Profile of SAFTTY

安的电子是中国家用自动控制器标准技术委员会委员企业，拥有十多项国家专利。
安的电子致力于服务中小型制造企业，提供物美价廉的产品，不设最小订单量，
提供定制化服务，切实满足客户要求。

2008年成立广州安的电子技术有限公司，同年在扬州投资设立制造工厂，
2011年在番禺新造设立新工厂，
2013年公司在扬州建立生产二厂。

安的电子是中国家用自动控制器标准技术委员会委员企业，拥有十多项国家专利。

安的主要研发生产销售各类热保护器,温控开关, 产品广泛应用于电机、水泵、风机、散热风扇、电源、电焊机、电池组、变压器、镇流器、照明设备、家用电器电加热产品的过流过热保护领域。公司品牌SAFTTY (safety technology的缩写)，寓意为客户提供安全可靠的产品，为员工提供安心的工作环境，为股东提供安稳的投资回报。

安的在广州设有研发试验室，拥有多名具有十多年研发经验的工程师，拥有有着十多年的热保护器销售、生产和技术支持经验的管理技术人才，致力于打造一个销售、服务和技术支持的温控产品专业平台，为客户提供各种产品过热问题的综合解决方案。

安的严格控制质量，为客户提供安全可靠的温控产品，电子原材料一律从美国、德国、日本进口，严格按照ISO9001质量体系认证标准进行品质管理，产品通过CQC UL TUV VDE认证。

速度就是效益，安的为客户提供高效、专业的服务，公司规定常规库存样品，当天之内必须发样，定制样品3~5天内发出， 批量订单7~10天交货，在客户订单下达后客服及时紧密联系，知悉产品制造情况，同时，安的在广州备有大量库存产品，确保供货及时；安的销售部配有技术支持人员，能及时为客户提供选型，产品使用， 测试等方面的技术支持，让客户在使用产品时没有后顾之忧。

安的电子致力于服务中小型制造企业，提供物美价廉的产品，甩掉国外进口烦恼，不设最小订单量， 提供定制化服务，切实满足客户要求。

2008, Guangzhou Saftty Electronic Technology Co., Limited was established, at the same year, a factory was invested and setted up in Yangzhou, Jiangsu Province
2011, Established a factory in Xinzao, Panyu, Guangzhou,
2013, Established Second factory in Yangzhou.

Saftty is a member of National Technical Standards Committee, patented more than 10 national inventions.

Saftty specializes in R&D and distributing all kinds of thermal protectors which are widely used in battery packs, motors, pumps, ballasts, transformers, coil, winding, portable power tools, electric heating appliances and home appliances for the over heat and over current protection. The brand " SAFTTY"(short for safety technology) means: providing safe products to customers; providing secure working environment to staffs; and providing steady investment return to shareholders.

Saftty has set up the test laboratory in Guangzhou and with engineers more than 15 years' R&D experiences and a group of high-quality salesman, production management and technical support personnel providing total solutions of overheat and over-current protection to customers.

Saftty strictly controls the quality of products and offer safe and reliable temperature control products to customers. Electronic materials are all imported from the United States, Germany and Japan. We strictly in accordance with the ISO9001 system. Products of Saftty have approval of CQC, UL, TUV and VED certification.

We provide fast and expert service to customers that we require standard samples to be sent out intraday and customized samples to be sent out within one week. The delivery time for large order is two weeks. During the production period, we will keep in touch with customer and let them know the progress. Meanwhile, we have large stock for regular models for timely shipment. Together with the salesman, we also have technicians who provide tech support such as model selection, product usage and test for customers.

研发团队，兵贵在精 R&D team

勇于创新，第一个吃螃蟹！
Bold innovation

安的产品总设计师尹向前，1998年开始涉足电子元器件产品的设计，主持和参与了100多项新品研发和80多项专利的申请。2008年尹总加盟安的电子，开始保护器的设计生涯，这五年中，尹总带领安的研发团队设计出十多款保护器新品，并申请到七项国家专利。

我们的研发团队不大，但个个都是精兵强将，最值得称赞的是2011年加盟的朱杰华。他是国内最早的保护器生产企业广州万宝的工程师，他曾参与德系产品整条自动化设备的引进，拥有多年的德系产品技术经验。

2011年，安的产品ST01是国内首款打破德国垄断的国产化新品。安的遵循制造精品，最可靠性、高一致性的产品标准，整合全球供应链资源，采取结构创新，材料创新等方式，积极使用行业外的新技术。我们在设计之初就考虑到产品的设计可靠性，安装可靠性，优先考虑优选供应商的零部件，并通过初试、中试等手段，发现问题，进行产品失效模式分析，将产品问题提前发现，在内部消化。

安的从2011年开始制定产品研发线路图，规划五年未来的产品研发方向。2011年BW小体积产品，ST01德系新品；2012年，ST01超薄2.5mm、ST01加PTC延时断电复位保护器；2013年，ST03超薄1.5mm新品，ST04 大电流20A新品；2014年 ST05超短型新品 ST02 超薄1.15mm新品 2015年ST06 10A新品，压缩机保护器新品。

安的与众不同的杰作将频频面世，我们期待与您共同见证！

Our chief designer Mr.Yin Xiangqian set foot in electronic product design from 1998 and has initiated and been part of new product research and development for over 100 items and has applied for more than 80 patents. Mr.Yin joined Saftty in 2008 and began design career for thermal protector.During the past five years,under the leadership of Mr.Yin,the R&D team has developed more than 10 new models of thermal protectors and has been patented 7 national inventions.

Saftty's R&D team is small but brightest.The most encouraging thing wad Mr.Zhu Jiehua joined us in2011.Mr. Zhu was the engineer of the Guangzhou Wanbao which was first production enterprise for thermal protector in China.Mr.Zhu involved in the introduction of whole sets of German automation equipment and having years of experience in Germany made product technology.

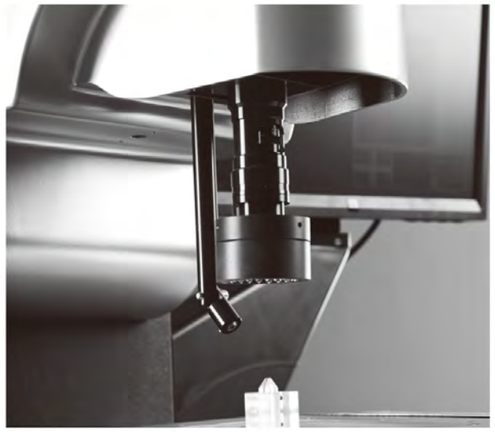
In 2011.Saftty released ST01 which is the first in domestic to break the monopoly of similar model from Germany companies.Saftty follows standards of manufacturing high quality products of most reliability and consistency by way of integrating global supply chain resources,structural design boost.material utilitarian and so on and new technology introduction from other industry.

In consideration of design reliability and installation reliability at the beginning of project developmen,we take priority to use parts and components from preferred suppliers and problem finding through small-scale test and pilot production.We process to analysis of failure patterns to find and solve problems in advance.

Saftty began a five-year plan for new product research and development from 2011.2011:Model BW-D series small size thetmal protector.Model ST01 thermal protector;2012:Super thin 2.5mm model ST01-S;model ST01-H with PTC self-hold;2013:super thin 1.5 mm Model ST03;Model ST04 with large rated current of 20A;2014:super small size Model ST05;super thin 1.15mm Model ST02;2015:ST06 with rated current of 10A;thermal protector for compressor.

More and more masterpieces will be released from Saftty and let's witness our growing and improvement.

检测技术 Test Technology



瑞士进口二次元检测设备

轻薄短小是未来电子产品的发展趋势，其使用的元器件也是同样趋势。我们设计的产品都是微型化为发展方向。为了检验更加微型的零部件，我们购买了从瑞士进口的二次元检验设备，该设备可以放大160倍，可清晰的观察微型元器件的结构。

SVM image measuring machine imported from Switzerland

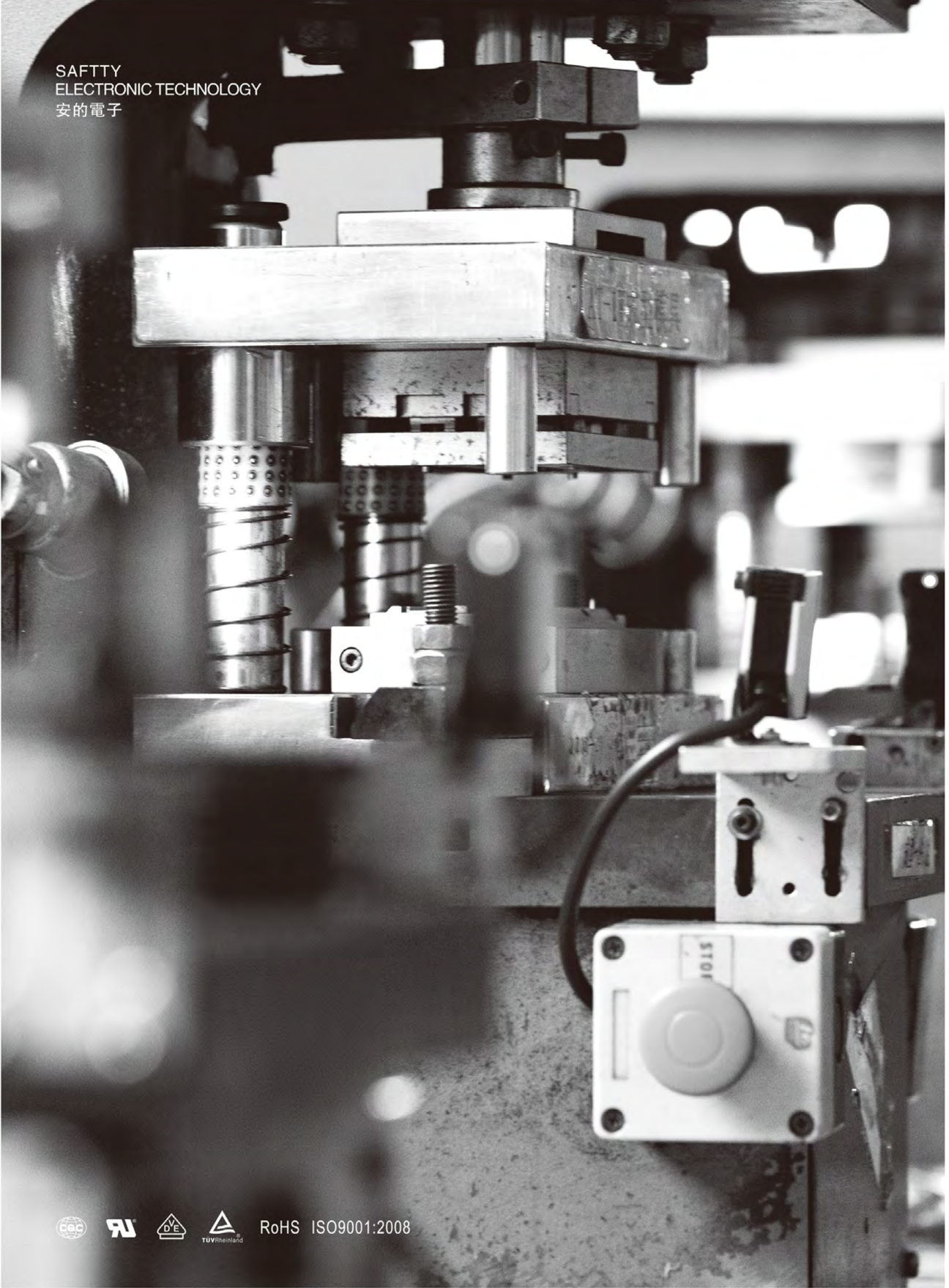
Miniaturization is the future development trend of electronic products, same for the use of components. Our products are designed into the development direction of miniaturization. To inspect miniature parts, we bought a SVM image measuring machine imported from Switzerland. The images could be enlarged 160 times, so the structural and surface characteristics of the micro-components could be observed clearly and it can carry on pattern matching with standard products.

高低温试验测试仪

模拟客户的使用环境,进行耐高低温冲击测试,最高温度300度，最低温度零下40度。

High and Low Temperature Test Instrument

To simulate the customer's use environment for high and low temperature impact resistance testing, the maximum temperature is 300 degrees and the lowest is minus 40 degrees.



X射线检测仪

通过X光拍摄产品内部结构，了解内部构造，判断结构合理性。

X-ray Detector Equipment

Shooting the internal structure of products by X-ray, to understand the internal structure, and determine the structure rationality.

耐压检测仪

测量触点打开后的500V耐压和2500V的绝缘电阻耐压。

Voltage- endurance test machine

Measurement on the contact in breaking state of withstand voltage 500V and 2500V withstand voltage of the insulation resistance

示波器

Oscillometer

显微镜

Microscope

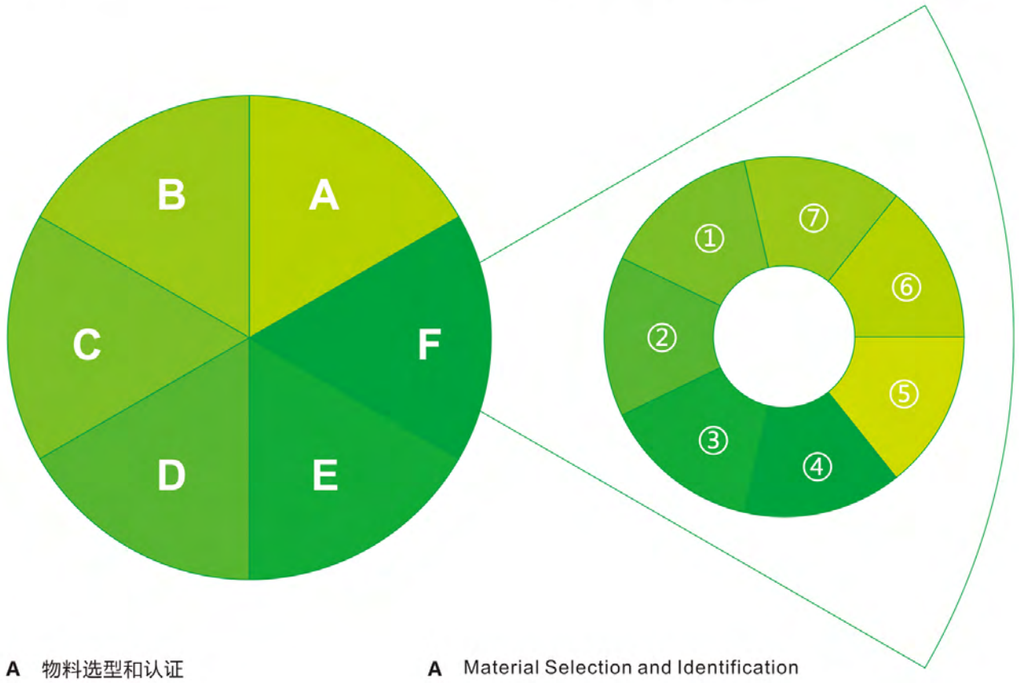
品质控制 Quality Control

没有最好，只有更好！

持续改善，追求完美，没有最好，只有更好！是我们的品质方针。为了实现50个PPM（百万分之五十）的不良率控制目标，我司通过六大体系控制产品的失效率。

Make it better and better!

Our quality guideline are continuous improvement, Make it better and better! In order to achieve the non-performing rate control target of 50 PPM (parts per million), we have the below six systems to control the product failure rate.



A 物料选型和认证
B 客户需求分析
C 装配可靠性分析
D PDM系统
E 失效分析管理
F 可靠性设计管理
① CHKLIST和CBB评审及奖惩管理制度
② CHKLIST建立
③ 测试报告模板
④ 工艺设计培训
⑤ 产品设计培训
⑥ 可靠性评审及项目管理制度
⑦ 设计报告模板

A Material Selection and Identification
B Customer Requirement Analysis
C Assembly Reliability Management
D PDM System
E Failure Analysis Management
F Reliability Design Management
① CHKLIST and CBB evaluation and incentive management system
② Reliability evaluation and project management system
③ Product design training
④ Technics design training
⑤ CHKLIST set up
⑥ Testing report template
⑦ Design report template

解决方案 Solution

通过独创的密封技术解决抽真空浸漆过程中的产品失效问题
We are committed to solve the product failure problems in vacuum impregnation process by original sealing technology

我们致力于通过独创的密封技术解决真空浸漆过程中的产品失效问题

电机生产中，会采用浸漆工艺来解决线圈的绝缘问题，传统的常压浸漆逐步被效率更高，效果更好的抽真空浸漆工艺替代，这就对热保护器产品的密封性能提出了更高要求。一般内埋线圈内或者捆扎在线圈上的保护器由于结构的问题，在真空浸漆过程中会有10%或者更高比例的内部会有漆进入，导致产品失效。

为了解决这个问题，我们技术部打开近千个产品外壳，仔细研究失效原因，发现90%以上的浸漆是由引线的铜芯同绝缘线皮之间的缝隙或者铜芯线之间的缝隙渗透到产品内部。为此，我们调整了零部件公差精度，产品结构和生产工艺，并购买了抽真空设备，经过反复试验，批量生产上万个产品测试，经过3个月的努力将失效率降低到千分之一以下，成为行业内同类产品不良率最低的企业。

We are committed to solve the product failure problems in vacuum impregnation process by original sealing technology

During motor manufacturing, dipping process will be used to solve the insulation problem of the coil. The traditional pressure impregnation was gradually replaced by vacuum impregnation process which is more efficient and better effect, so there would be higher requirements for the sealing performance of the thermal protectors. Due to structural problem, the thermal protectors which are buried or strapped in the coils would have 10% or higher percentage rate of paint penetrated into, and cause product failure.

In order to solve this problem, our engineers opened thousands of product cases to research the failure cause carefully. They found that more than 90% paint penetrated into the products are caused by the gap between the copper core wire with insulation wire skin cracks or copper core wire. Therefore, we adjust the components tolerances, product structure and production process accordingly, and purchase a vacuum pumping equipment for testing. After repeated tests and mass production of tens of thousands of products, the product failure rate is now reduced to below 1/1000 after 3 months of hard work, and Saftty is the enterprise with the lowest non-performing rate of similar products in the industry.

解决方案 Solution

高效能定制化服务，帮助客户解决成本压力
Customized products to help customers solve cost pressure

客户定制，帮助客户解决成本压力

锂离子电池组过热保护方案中，有时会选择同时对充电和放电过程进行监控，放电过程的保护温度为70度左右，充电过程的保护温度为50度左右，如果客户选择这种方案，会同时购买两个保护器，大大增加了成本。所以有客户提出能否降低成本，用两个保护器，但是价格是一个保护器的价格。这就要求我们要降低50%的成本。

为了达到客户的需求,我们在不降低品质的前提下,对产品结构设计,材料选择,性能优化等方面进行了非常深入的改进,精简了零部件,使得结构更简化,把强电应用的材料改成弱电应用材料,降低材料成本;在性能方面我们积极同客户配合,了解客户的真实需求,制定合理的更适于客户的性能需求参数,进一步降低了生产和检验成本;三个月后,当客户拿到只有之前一半价格的产品时,非常惊讶,当时客户只是尝试提出这种"无理要求",并没有真的觉得这个要求可行,但我们安的电子做到了,真心实意地帮助客户解决问题.

Customized products to help customers solve cost pressure

In lithium ion battery overheating protection project, sometimes it would choose to both monitor the process of charging and discharging. Protection temperature on discharging process is about 70 degrees and on charging process is about 50 degrees. If customers choose this project, they have to buy two thermal protectors which will increase the cost. So customers raise the requirement of cost down, to buy two thermal protectors with the price of one. Therefore, we have to reduce cost by 50%.

In order to meet customers' requirement, without reducing quality, we make deep improvements on the product structural design, materials selection, performance optimization ect.Therefore,the structure is more simplified,as parts steamlied.To reduce material cost,we change strong current application materials to weak current application materials.In terms of performance,we actively communicate with customenrs and understand their real needs,to make reasonable performance parameters which are more suitable for customers'demand,and production and inspection cost is further reduced in this way.After three months,the customer was shocked when they got product which is only half price than before.At that time,the customer only tried to put forward this"unreasonable demand"and they did not really think it would work,but we Saftty did it and helped customers solve the problems.

资质认证 Qualification Certifications

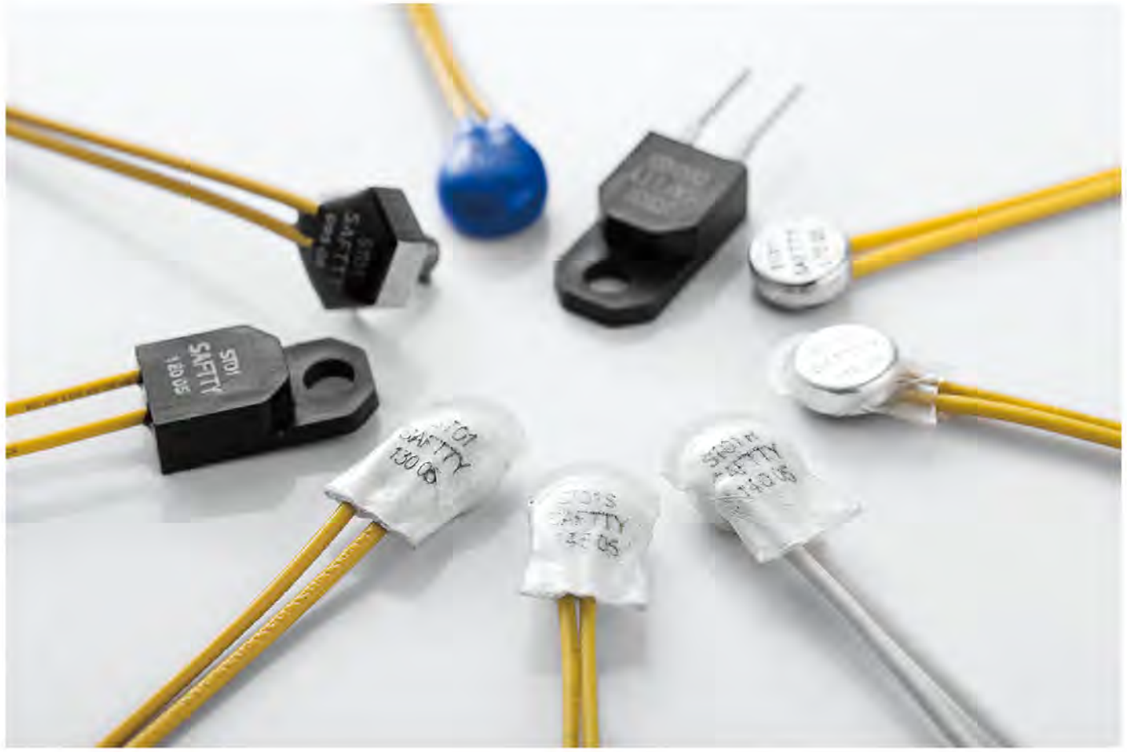
安的是微型热保护器领域获得多项专利和国际认证的中国企业之一。
In China, we are one of enterprises who obtain plenty of patents and international certifications in the micro thermal protector field.

全球最大的缓动式温控器厂商PEPI同我们结成战略联盟，彰显安的的品质获得国际同行的认可；巴西施耐德和美国惠普的常年采购，证明我们的品质经得起国际大厂的苛刻考验。安的电子遵循“有缺陷的产品就是废品”的品质理念，追求完美，持续改进！

The world's largest creep-action thermostat manufacturer PEPI and our company come to a strategic cooperation agreement which indicates that the quality of Saftty has gained the international peer recognition; Brazil Schneider and the United States HP's perennial procurement has proved that our quality stands up to international companies' strict test. Saftty electronic follows the quality concept "defective product is waste", pursuits of perfection, continuous improvement!

RoHS ISO9001:2008

ST01 SERIES(核心产品) / 电机超温保护器&温度保护器&热保护器



KEY BENEFITS 产品优势

- First China-made round shape thermal protector got UL and TUV certified and broke 30 years' monopoly of Germany protectors.
- Good sealed, can prevent product failure from vacuum impregnation process
- Small size, suitable to be embedded inside coil
- Metal case, up to 50 KG coil shaping pressure, has high thermal conductivity and temperature sensitive.
- Pure temperature action type products, bimetal-disc without current and heat effect, accurate temperature control.
- 国内首款获得UL 和TUV认证，打破德国三十年垄断的保护器
- 密封性好，能防止抽真空浸漆过程的产品失效
- 体积小，适合内埋于线圈内部
- 金属外壳，能承受50Kg的线圈整形压力，热传导性好，对温度敏感
- 纯温度型产品，电流不经过双片，没有电流热效应，控温准确

APPLICATION 应用范围

- Motors
- Transformers
- Coils
- Electronics,sensor
- 电机
- 变压器
- 线圈
- 电子产品、传感器

ST01 SERIES(核心产品) / 电机超温保护器&温度保护器&热保护器

Integration of resources 配套技术

- Integration of global supply chain resources, we buy bimetal-disc from the world's largest bimetal-disc material manufacturer EMS in the United States and case from German supplier who uses stamping forming technology
- Spring which material comes from NGK Japan and manufactured by Japanese stamping supplier.
- Silver plating technology on case and spring which greatly reduces the contact resistance.
- The key component bimetal-disc produced by fully automated molding equipment and sorted by tunnel oven separation equipment is good consistency and stable performance.
- 整合全球供应链资源，双片采用全球最大的双片制造商美国EMS的材料，外壳采用德国供应商的冲压成型技术，
- 簧片采用日本NGK的材料，由日本冲压件供应商加工生产
- 外壳和簧片采用镀银工艺，极大降低了接触电阻
- 核心部件双片采用全自动化成型设备和温度筛选隧道窑生产检测，一致性好，性能稳定

CODE SYSTEM 命名规则

ST01 X XXX XX XX XXX XXX XXX XXX X

ST01:Model No.
型号

A:Normally closed 常闭型
B:Normally open 常开型

Temperature 动作温度

Tolerance 05(±5K),08(±8K),10(±10K)
公差

Lead wire:Y1(yellow AWG22),Y2(yellow AWG24),Y3(other)
线规：Y1(AWG24黄色) Y2(AWG24黄色) Y3(其他)

Lead Length 引线长度

L1 L2 L3 L4

U1: Shrink cap insulation
带绝缘套管
U2: Without cap insulation
不带绝缘套管
U3: Without epoxy cover and lead wire
无环氧和引线
U4: With epoxy cover
环氧包封
U5: Transparent shrink cao insulation
带透明绝缘套管
U6: High temperature resistant plastic insulating case,lesds connected
耐高温塑料绝缘套外壳，引线连接
U7: With M4 threaded case
带M4螺纹外壳
U8: High temperature resistant plastic insulating case,pin connected
耐高温塑料绝缘外壳，插脚连接
U9: Round shape,high temperature resistant plastic case
圆形耐高温塑料外壳

MARKING 标识

SAFTTY: Company name 广州安的电子
ST01: Model No. 产品型号
120: Response temperature (120℃)
动作温度
05: Tolerance(±5K)公差

CERTIFICATION 认证

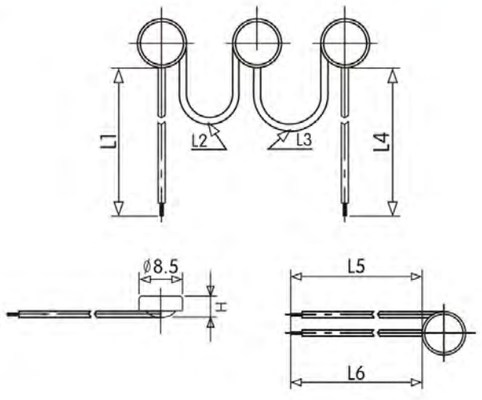
	Agency	Standard No.	File No.	Application
	CQC	GB14536.3	CQC12002072538	Motor protector
	TUV	IEC 60730-2-9	R 50230650	Thermostat
	UL	2111/60730-2-2	E 336150	Thermal motor protector

TECHNICAL DATA 技术参数表

	Normally closed 常闭型	Normally open 常开型
Nominal Switching Temperature,in 5K-step(TK) 动作温度	60~180℃	60~180℃
Tolerance-Standard 公差	±5K/±8K/±10K	±5K/±8K/±10K
Reset temperature range 复位温度范围	-30K±15K	-30K±15K
Max. operating voltage 最高电压	500VAC 60VDC	500VAC 60VDC
Working current 电流	250VAC 6A	250VAC 6A
Cycles at 250VAC/3.0A cos Φ1.0 寿命	10000	10000
Cycles at 250VAC/6.3A cos Φ1.0 寿命	3000	◯
Cycles at 250VAC/4.0A cos Φ0.45寿命	1000	◯
Cycles at 250VAC/1.0A cos Φ0.45寿命	10000	◯
Contact resistance 接触电阻(55mm线长)	<50m	◯
Insulation voltage 绝缘电压	2.5KV	2.5KV
Insulation sleeve length "a" 绝缘套管长度	>15mm	>15mm
Diameter "d" 直径	<8.9mm	<8.9mm
Height "h" 高	<4.6mm	<4.6mm
Lead wire-electric 电子线(Standard 标准线)	UL3398 AWG22 300V 150℃	UL3398 AWG22 300V 150℃
Lead wire-teflon 氟塑线(可选)	UL10362 AWG22 600V 250℃	UL10362 AWG22 600V 250℃
Lead wire-silicone 硅胶线(可选)	UL3135 AWG24 600V 200℃	UL3135 AWG24 600V 200℃
Outgoing lind length-standard 标准线的长度	L1=L4=520±10mm L2=L3=200±5mm L5=L6=55±5mm	L1=L4=520±10mm L2=L3=200±5mm L5=L6=55±5mm

Note:The above data is for our standard product(with UI3398 AWG22 white wire,U5)
以上为我司标准产品参数(UL3398 AWG22 白色线 U5)

STRUCTURE 结构图



Standard lead-wire L1,L4:520mm ± 10mm; L2,L3:200mm ± 5mm
L5,6:55mm ± 5mm

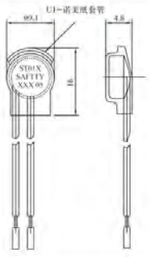
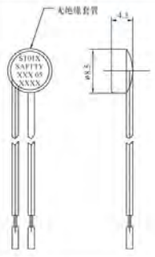
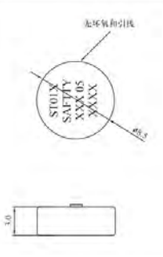
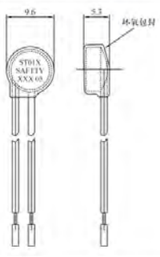
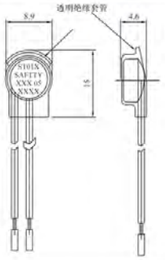
ADVANTAGES 优势

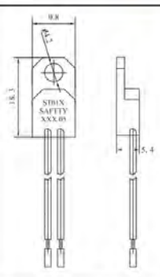
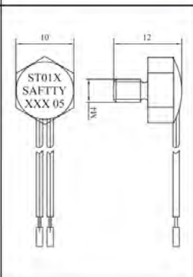
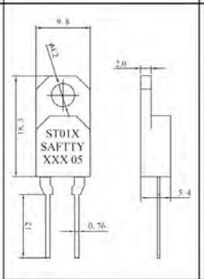
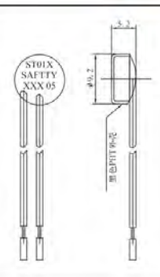
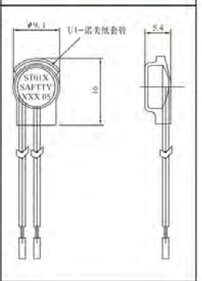
Contact: Silver-nickel alloy, with long lifetime, over-current capcbility
触点：银镍合金，寿命长，过流能力强

Spring:Beryllium copper imported from Japan,with good elasticity
簧片：日本进口NGK铍铜，弹性好

Case: Metal Case,better thermal Conduction, precision control within 0.02mm, the thickness of silver plated on the surface up to 3um
外壳：金属外壳，导热更好，精度控制0.02mm，表面镀银层厚达3um

DIMENSIONAL DRAWING OF DIFFERENT CAPSULATION 不同封装形式的尺寸图

Type	ST01	ST01	ST01	ST01	ST01
Code	U1	U2	U3	U4	U5
Insulation					
Drawing dimensions (mm)					
Technical specification	With shrink cap insulation 带绝缘套管	Without cap insulation 不带绝缘套管	Without epoxy cover and lead wite 无环氧与引线	With epoxy cover 环氧包封	Transparent shrink cap insulation 带透明绝缘套管

Type	ST01	ST01	ST01	ST01	ST01-H (self-hold 延时保护)
Code	U6	U7	U8	U9	U1
Insulation					
Drawing dimensions (mm)					
Technical specification	High temperature resistant plastic insulating case 耐高温塑料绝缘外壳	With M4 threaded case 带M4螺纹外壳	High temperatuer resistant plastic insulating case with pin connected 带插脚耐高温塑料绝缘外壳	Round shape,high temperature resistant plastic case 圆形耐高温塑料外壳	With PTC self-hold 加PTC延时保护 (断电复位)

The above dimensions are for your reference.The actual one should be confirmed by both sides.以上尺寸仅供参考，以实际尺寸为准

ST03 SERIES 热保护器&温控开关&温度开关

KEY BENEFITS 产品优势

- The size of ST03 thermal protector is the smallest in the world, easy for installation.
- Accurate temperature response and sensitive, reliable performance.
- 热保护器体积全球最小，便于安装。
- 动作灵敏，感温精准，性能可靠。

APPLICATION 应用范围

- Electric field
- Switching power supply
- Welding machine
- Lithium-ion battery packs protection board
- Fire alarm etc
- 电控领域
- 开关电源
- 电焊机
- 锂离子保护板
- 消防报警等

KEY SPECIFICATIONS/SPECIAL FEATURES 性能参数

- Nominal Operating Temperature:60-100°C
- Tolerance:(+/-)5k,10k,15k
- Reset Temperature:Generally two-thirds of
- The operating temp.+/-15k
  size:10.5*5.1*1.7mm
- Standard working current:<24V,500mA
- Cycles at standard working current:10000
- Contact resistance:less then 10Ω with standard lead length
- Insulation voltage:2.5KV
- Standard lead wire:UL3398/3266 AWG24
  standard lead length:L1=L2=60±10mm
- 额定动作温度，每5度成系列(Tk):60-100°C
- 标准公差：±5K,±10K,±15K
- 复位温度范围：动作温度的三分之二±15K
- 体积：10.5*5.1*1.7mm
- 额定电流：<24V,500mA
- 在额定电流情况下开关次数：10000次
- 接触电阻：标准引线长度产品的接触电阻应不大于10Ω
- 绝缘电压：2.5KV
- 标准导线：UL3398/3266 AWG24
- 导线标准长度：:L1=L2=60±10mm

ST08 SERIES

ST08 series are both temperature and current sensitive.

They can protect motor from over heating or loading.

ST08是一款同时具有过流、感温双重保护功能的保护元件，

它能够精确控制电机堵转或过载电流，以减少对电机的损伤。

SPECIAL FEATURES 特性

- Small size, long life and high reliability.
- High level bimetal ensures that it can withstand the current of normal circuit.
- The combination of bimetal and heater can action snappily.
- Accurate trip off time can prevent motor from overheating.
- Both temperature and current sensitive.
- Terminals are optional and customized.
- Wires are optional and customized.
- Sealed sleeving can make the protector varnishing proof.
- 体积小型化、长寿命和高可靠性。
- 使用导电性能良好的双金属材料，确保其可承受正常回路电流的要求。
- 双金属片与电热丝组合具有快速跳脱性。
- 非常精确的跳闸时间，防止马达温度过高。
- 具备有感应电流及温度而动作之双重性能。
- 每款零件均严格执行欧洲ROHS的环保标准。
- 端子有多款种类，可供灵活选择：
  一端出端子的ST08-A或两端出端子的ST08-B。
- 可依客户要求制作特定的规格或铆线服务。

APPLICATION 应用范围

- Window-lifts; Sunroof motor; Aerial Tuning Motor
- Wipers; Door locks; Adjuster-Motors
- Various washing machines, vacuum cleaners and gardening equipments
- 车窗马达、天窗马达、天线马达
- 雨刷发动机、滑门发动机、调节器发动机
- 多种洗衣机、吸尘器、园林设备

ELECTRICAL RATINGS 电气规格

- 30A/15V DC
- 15A/30V DC
- 18A/250V AC
- 28A/125V AC

TECHNICAL PARAMETERS 技术参数

- Action temperature range: 50°C~180°C
- Temperature tolerance: ±2°C,±3°C,±5°C
- Trip off current range: 3~32A
- Trip off time: 4~10S or customizing
- 使用温度范围：50°C~180°C
- 温度公差： ±2°C,±3°C,±5°C
- 选择控制过载电流跳脱范围：3~32A
- 跳脱时间：4~10S

ST07 SERIES

KEY BENEFITS 产品优势

- Individually temperature checked on Modern equipment
- Material of snap-action disc is made by the famous USA Engineer Material System
- Repeatable temperature performance over life
- Gasketed steel case suitable for most impregnation processes
- Wide selection of leads and insulating sleeves
- 自动化设备全检动作温度
- 双金属片材料由美国EMS公司提供
- 产品使用寿命长
- 防水防真空浸漆设计
- 可提供连接线和绝缘护套

APPLICATION 应用范围

- Shaded pole motors
- Permanent split capacitor motors
- Fluorescent lighting ballasts
- HID ballasts
- Transformers
- Recessed lighting fixtures
- Battery Packs
- Vacuum cleaners
- Automotive accessory motors
- Solenoids, PC boards and other applications
- 罩极电机
- 分马力电机
- 荧光灯整流器
- 金卤灯镇流器
- 变压器
- 灯具安装支架或灯罩内壁
- 电池组
- 吸尘器
- 汽车马达
- 螺丝管，PCD电路板等领域

CERTIFICATIONS 认证

AGENCY	STANDARD NUMBER	APPLICATION
UL	2111	Motor Protection
VDE	EN 60730-2-2	Motor Protection

MAXIMUM CONTACT RATINGS
触点最大容量 6000 cycles

VOLTAGE	CURRENT
	ST07-CG
270 VAC	10A
120 VAC	22A
16 VDC	20A

OPERATION

The operating principle of the ST07 is both simple and effective. At the heart of the protector is a bimetal snap action disc. When the temperature of this disc reaches its rated temperature it snaps open, resulting in an open circuit. This temperature is reached during a fault condition, caused by either an increase in ambient temperature, an increase in current flowing through the disc, or a combination of both. After the ST07 breaks the circuit, the system cools and the ST07 automatically resets allowing power to be restored to the circuit.

ST07的核心部分是一个银铜合金的双金属片，当环境温度达到产品设定的断开温度，ST07的双金属片会弯曲变形切断电路，形成保护。当温度下降时，它会自动复位，让电路重新接通。

QUALITY

Each ST07 rating has a bimetal disc designed and manufactured for that specific temperature rating. Each individual device is then calibrated and checked for opening temperature. This results in precise operating characteristics necessary to achieve consistent, reliable performance over the required life cycle. This high level of performance is obtained through our traditional emphasis on quality.

核心部分双金属片的材料选用国际知名公司EMS的产品，双片成型由自己生产，便于控制质量，断开温度全检，这些都是我们严控质量的传统。

NUMBERING SYSTEM

ST07 XXX X X – X

Standard Opening Temperature

Opng. Temp. ℃	Low Resistance Bimetal Disc	High Resistance Bimetal Disc
	Code	
50	017	197
55	018	198
60	019	199
65	020	–
70	021	201
75	022	202
80	023	203
85	024	204
90	025	205
95	026	206
100	027	207
105	028	208
110	029	209
115	030	210
120	031	211
125	032	212
130	033	213
135	034	214
140	035	215
145	036	216
150	037	217
155	038	218
160	039	219
165	040	–
170	041	–
175	042	–
180	043	–

Terminal Configuration

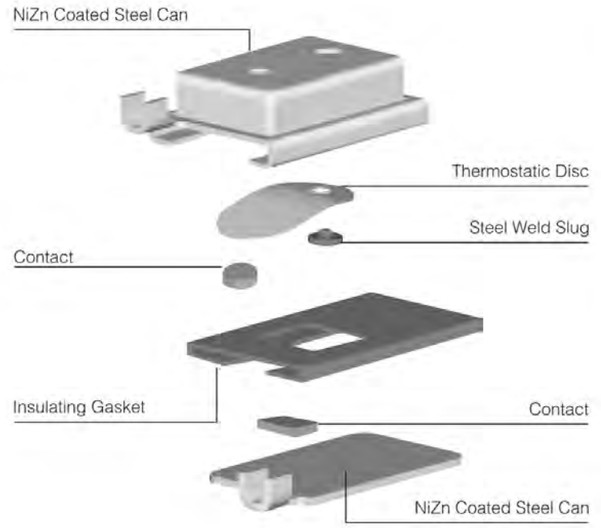
Code	Terminals
A	Same end
B	Opposite end

Temperature Tolerance

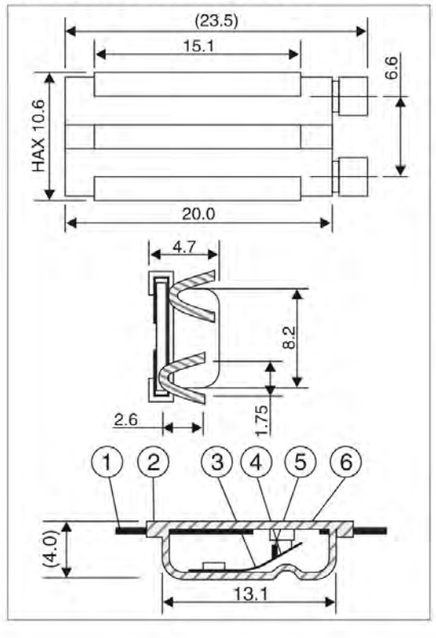
Code	Tolerance
5	±5℃

Physical Characteristics

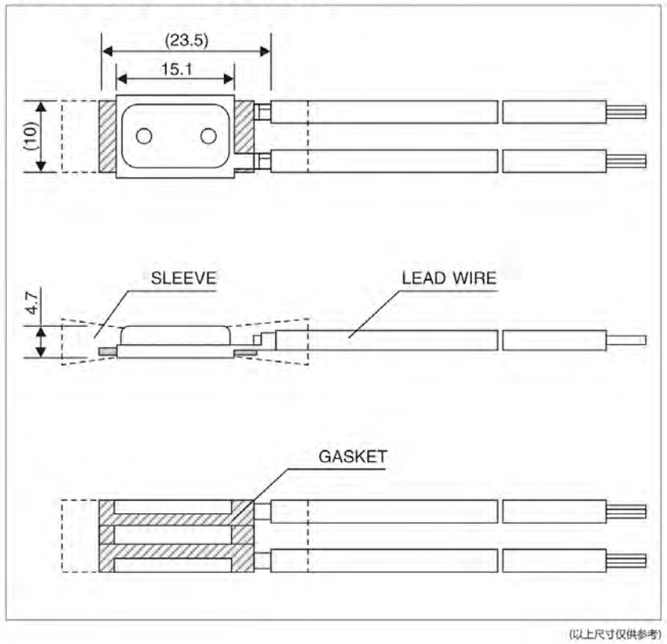
Code	L(mm)
4	66.7



A-TYPE CONSTRUCTION



A-TYPE CONFIGURATION



(以上尺寸仅供参考)

ST09 SERIES

FEATURES 产品特点

- Robust Electrical Conduction Design: Terminals and the external wire are fixed with the nut, and has been designed to be an integral formation of the energized structure, which can solve the abnormal heating problem when the rivets become loose in high temperature, which finally can enhance the performance of conducting heavy current.
- Reset Level Structure: The reset lever key has been designed to be an integrated structure, which can solve the reset lever stuck problem of competing products and also avoid other a series of problems to improve its safety performance.
- Higher Contact-off Space: The prodcut's structure design has used ever principle to achieved the performance that contact's opening distance has get 1.5mm or more after the bimetal's Sudden jump. Namely the action type could entirely meet the 2.A to guarantee the insulation between power supply and disconnecting parts belong to the basic insulation.
- Product Shape Structure: The product makes the structure optimization desigh and simulation design in the process of designing products, comparing to the existing products, the product space size reduce by 30%. With the characteristics of compact in structure and lightweight, which effectively solve the installation limitations caused by the large volume of product. Allowing for a wider range of product applications.
- Faster Thermal Response Time: The cap has been designed to be the convex groove structure, and bimetal is almost close to the sensing temperature surface of the product, which could improve the temperature sensing rate of the bimetal to achieve the function of rapid sensing temperature, and higher in the control accuracy.
- The product has achieved national patent.

- 通电连接方式：接线端子与外接导线采用螺母固定，形成通电一体结构、避免因铆接松动产生的发热异常， 提高了产品过大电流性能。
- 复位杆结构：复位杆按键一体式结构设计，解决竞品因复位杆卡死等一系列不良问题，提高产品安全性能。
- 触头断开结构：结构设计运用了杠杆原理，实现了碟片动作后触头断开距离1.5mm以上，即动作类型满足全断开2.A型，保证电源与断开部件之间的绝缘属于基本绝缘。
- 产品外形结构：采用结构仿真优化设计，使产品尺寸比现有产品减少30%，具有结构紧凑轻巧的特点，有效解决因产品体积大造成的安装局限，应用范围得到极大地提高。
- 快速感温结构：封盖采用凸槽设计，碟片与感温面接近贴合，提高碟片感温速度，实现了产品快速感温功能，温度控制精度更高。
- 产品已获得国家专利。

SPEC. OF SERIES ST09 技术参数

- Rating:AC 250V,45A/60A
- Open Tenp.:40~150°C
  (According to Request of Customers)
- Tolerance of Open Temp.:±3°C,±4°C,±5°C
- Insulation Resistance:≥100Mohm(DC500V)
- Contact Resistance:≤50mOhm
- Dielectric Strength:1500V for 1 min
- Life cycles:10K cycles
- Action Type:2.A

- 电气性能：AC 250V,45A/60A
- 断开温度：40~150°C(根据顾客需要)
- 断开温度公差：±3°C,±4°C,±5°C
- 绝缘电阻：≥100mΩ (DC500V)
- 接触电阻：≤50mΩ
- 电气强度：1500V/min
- 使用寿命：10000次
- 动作类型：2.A

BW-B SERIES / BW-B 系列产品

KEY BENEFITS 产品优势

- Miniature size
- Positive make and break with snap-action disc
- Competitive price
- Suitable for most impregnation processes
- 体积小
- 速动型双金属，反应速度快
- 有竞争力的价格
- 防真空浸漆工艺

APPLICATION 应用范围

- HID ballasts
- DC motor
- Battery packs
- Heating appliance
- Fractional Power Motor
- Transformer
- AC brushless motor and pump
- 金卤灯镇流器
- 直流马达
- 充电电池组
- 电加热器具
- 分马力电机
- 变压器
- 交流无刷马达和水泵

ITEM NO 型号	VOLTAGE&CURRENT 电压&电流	CASE MATERIAL 外壳材质	CASE SIZE(MM) 尺寸	OPEN TEMP.RANGE(°C) 动作温度范围	FILE NO. 认证号	STANDARD NO. 标准	LEAD WIRE 导线
BW-BCP	250VAC/6A 24VDC/6A	Plastic 塑壳	15x7.0x3.5	35-130	UL:E336656	UL60730-2-9	35-125℃: 3266 22# 70mm ≥130℃: 3135 20# 70mm
					VDE:40042780	EN60730-2-9	
				50-155	CQC:13002100964	GB14536.3	
BW-BCM	250VAC/6A 24VDC/6A	Metal 铁壳	15x6.4x3.1	35-160	UL:E336150	UL60730-2-2	
					VDE:40042780	EN60730-2-9	
				50-155	CQC:13002100965	GB14536.3	

MAXIMUM CONTACT RATINGS 触点最大容量10000 cycles.

CODE SYSTEM 产品编号代码图

BW - X X X - X X℃

- Open Temperature 动作温度
- M-metal case 铁壳，P-plastic case 塑壳
- C-normally close 常闭型，O-normally open 常开型
- B-small size 小体积
- Device No. 产品型号

OPEN TEMP & RESET TEMP 额定动作温度和复位温度图

MODEL	OPEN TEMP(℃)	RESET TEMP(℃)	MODEL	OPEN TEMP(℃)	RESET TEMP(℃)
40	40±4.5	≥30	105	105±5	75±15
45	45±5	≥33	110	110±5	75±15
50	50±5	≥35	115	115±5	80±15
55	55±5	42±6	120	120±5	85±15
60	60±5	45±8	125	125±5	85±15
65	65±5	48±10	130	130±5	90±15
70	70±5	50±12	135	135±5	95±15
75	75±5	53±14	140	140±5	100±15
80	80±5	55±15	145	145±5	100±15
85	85±5	60±15	150	150±5	105±15
90	90±5	65±15	155	155±5	110±15
95	95±5	70±15	160	160±5	115±15
100	100±5	70±15	165	165±5	120±15
-	-	-	170	170±5	125±15

BW-D SERIES / BW 系列塑壳产品—小体积，大电流热保护器

KEY BENEFITS 产品优势

- Miniature size
- Positive make and break with snap-action disc
- Competitive price
- Suitable for most impregnation processes

- 体积小
- 速动型双金属，反应速度快
- 有竞争力的价格
- 防真空浸漆工艺

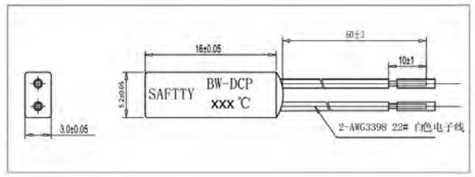
APPLICATION 应用范围

- HID ballasts
- DC motor
- Battery packs
- Heating appliance
- Fractional Power Motor
- Transformer
- AC brushless motor and pump

- 金卤灯镇流器
- 直流马达
- 充电电池组
- 电加热器具
- 分马力电机
- 变压器
- 交流无刷马达和水泵

CERTIFICATIONS 认证

AGENCY	STANDARD NUMBER	FILE NO.	TEMP.RANGE
VDE	EN60730-2-9	40032861	30~150℃
UL	UL873	E336656	40~130℃



MAXIMUM CONTACT RATINGS 触点最大容量

VOLTAGE	CURRENT	CYCLES
250V	6A	10000
24V	5A	6000

LEAD WIRE 导线
3398 AWG22# or Nickel strip normally.length is 60mm or according to customer's requirement.

CODE SYSTEM 产品编号代码图

BW－XXX－XX℃

- Open Temperature 动作温度
- P-plastic case 塑壳
- C-normally close 常闭型，O-normally open 常开型
- D-small size 小体积
- Device No. 产品型号

OPEN TEMP & RESET TEMP 额定动作温度和复位温度图

MODEL	OPEN TEMP(℃)	RESET TEMP(℃)	MODEL	OPEN TEMP(℃)	RESET TEMP(℃)
BW-DCP-40℃	40±5℃	≥27℃	BW-DCP-95℃	95±5℃	70±15℃
BW-DCP-45℃	45±5℃	≥30℃	BW-DCP-100℃	100±5℃	70±15℃
BW-DCP-50℃	50±5℃	≥33℃	BW-DCP-105℃	105±5℃	75±15℃
BW-DCP-55℃	55±5℃	34-47℃	BW-DCP-110℃	110±5℃	75±15℃
BW-DCP-60℃	60±5℃	35-52℃	BW-DCP-115℃	115±5℃	80±15℃
BW-DCP-65℃	65±5℃	36-57℃	BW-DCP-120℃	120±5℃	85±15℃
BW-DCP-70℃	70±5℃	38-60℃	BW-DCP-125℃	125±5℃	90±15℃
BW-DCP-75℃	75±5℃	38-63℃	BW-DCP-130℃	130±5℃	95±15℃
BW-DCP-80℃	80±5℃	55±15℃	BW-DCP-135℃	135±5℃	100±15℃
BW-DCP-85℃	85±5℃	60±15℃	BW-DCP-140℃	140±5℃	105±15℃
BW-DCP-90℃	90±5℃	65±15℃	BW-DCP-145℃	145±5℃	105±15℃

BW-D SERIES / BW 系列—表面不带电，不需绝缘套管的铁壳热保护器

KEY BENEFITS 产品优势

- Case not charged, without insulating sleeve (solve installation problem of sleeve off and broken)
- Temperature sensitive
- Better pressure resistance

- 表面不带电，不需绝缘套管（解决安装时套管容易脱落和破损的麻烦）
- 感温更灵敏
- 抗压强度更高

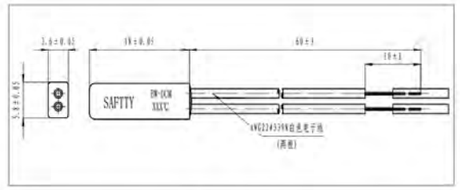
APPLICATION 应用范围

- HID ballasts
- DC motor
- Battery packs
- Heating appliance
- Fractional Power Motor
- Transformer
- AC brushless motor and pump

- 金卤灯镇流器
- 直流马达
- 充电电池组
- 电加热器具
- 分马力电机
- 变压器
- 交流无刷马达和水泵

CERTIFICATIONS 认证

AGENCY	STANDARD NUMBER	FILE NO.	TEMP.RANGE
VDE	EN60730-2-9	40032861	30~150℃
UL	UL873	E336656	40~130℃



MAXIMUM CONTACT RATINGS 触点最大容量

VOLTAGE	CURRENT	CYCLES
250V	6A	10000
24V	5A	6000

LEAD WIRE 导线
3398 AWG22# or Nickel strip normally.length is 60mm or according to customer's requirement.

CODE SYSTEM 产品编号代码图

BW－XXX－XX℃

- Open Temperature 动作温度
- M-metal close 铁壳
- C-normally close 常闭型，O-normally open 常开型
- D-small size 小体积
- Device No. 产品型号

OPEN TEMP & RESET TEMP 额定动作温度和复位温度图

MODEL	OPEN TEMP(℃)	RESET TEMP(℃)	MODEL	OPEN TEMP(℃)	RESET TEMP(℃)
BW-DCM-40℃	40±5℃	≥27℃	BW-DCM-95℃	95±5℃	70±15℃
BW-DCM-45℃	45±5℃	≥30℃	BW-DCM-100℃	100±5℃	70±15℃
BW-DCM-50℃	50±5℃	≥33℃	BW-DCM-105℃	105±5℃	75±15℃
BW-DCM-55℃	55±5℃	34-47℃	BW-DCM-110℃	110±5℃	75±15℃
BW-DCM-60℃	60±5℃	35-52℃	BW-DCM-115℃	115±5℃	80±15℃
BW-DCM-65℃	65±5℃	36-57℃	BW-DCM-120℃	120±5℃	85±15℃
BW-DCM-70℃	70±5℃	38-60℃	BW-DCM-125℃	125±5℃	90±15℃
BW-DCM-75℃	75±5℃	38-63℃	BW-DCM-130℃	130±5℃	95±15℃
BW-DCM-80℃	80±5℃	55±15℃	BW-DCM-135℃	135±5℃	100±15℃
BW-DCM-85℃	85±5℃	60±15℃	BW-DCM-140℃	140±5℃	105±15℃
BW-DCM-90℃	90±5℃	65±15℃	BW-DCM-145℃	145±5℃	105±15℃

RYD THERMAL CUTOFF / RYD 温度保险丝

FEATURES 特点

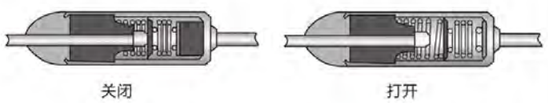
Fusible heat cutoff is small and strong heat protector that can detect if the temperature is abnormal and cut the circuit. It can be used to etectd abnormal temperature rising of electrical appliances for home and industrial use and circuit can be cut rapidly so as to prevent fire disaster.
Fusible heat cutoff has two types. One is RYD model which use heat sensitive grain materials(organic chemical) as heat sensitive material and the other is RHD model which has low melting alloy. Rated operating temperature is 96℃~240℃ and they can be used for all kinds of products with rated current of 0.5A~15A.

熔断式热保护器具有检测出温度异常并切断电路之功能的小型、结实的熔断式热保护器。它可检测家用或工业用电气产品的温度异常升高，并迅速及时的切断电路、可达到防止火灾于未然的作用。
熔断式热保护器使用热敏颗料（有机化学物质）为感热材料的RYD型和低熔点合金的RHD型两种。额定动作温度范围96℃~240℃，有额定电流为0.5A~15A的各规格产品。

APPLICATION 应用范围

- Electric Blower 电热吹风
- Electric Furnace 电热炉
- Microwave Oven 微波炉
- Refrigerator 冰箱
- Rice Cooker 电饭煲
- Coffee Machine 咖啡壶
- Sandwich Furnace 三明治炉
- Electromotor 电动机

STRUCTURE&OPERATIING THEORY 构造与工作原理



关闭　　打开

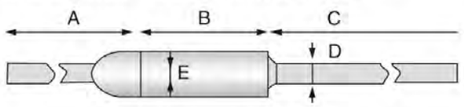
RYD fusible thermal cutoff strucutre and operating theory.
RYD fusible thermal cutoff is to put heat sensitive grain material(organic chemicals) into metal cover for over–heat shut off. The main feature is that it can cut 10A or 15A high current(rated current).

RYD熔断式热保护器是将热敏颗粒(在机化学物质)材料装入金属外壳中进行过热切断的。其特点是可切断10A或15A的大电流(额定电流)。

CERTIFICATIONS& RATINGS 认证&额定值

UL	120V	15A
TUV	250V	10A/15A
PSE	250V	10/15A
EK	250V	10A
CCC	250V	10/15A

DIMENSIONAL DRAWING 尺寸图



Specification and standard(mm)				
A	B	C	D	E
25±1	11.5±1	35±1	⌀1±0.05	⌀4.0±0.1

CODE SYSTEM 产品编码代码图

- RYD xxx Device Number 产品型号
- 250V10A Rated Voltage、Rated Current 额定电压、额定电流
- □TF Approved Mark for Electrical Appliance 电气用品认可标记
- XXX℃ Rated Operating Temperature 额定动作温度

Rated Table 额定表

型号 Model Rated	TFc	THc	TMc	Safety Certification 通过以下安规认证					
				UL 美国	TUV 德国	PSE 日本	EK 韩国	CCC 中国	SUG 环保
RYD73	73	53	150	/	/	O	/	/	O
RYD77	77	57	150	O	O	O	O	O	O
RYD84	84	64	150	O	O	O	O	O	O
RYD98	98	78	150	/	/	O	/	/	O
RYD99	99	79	150	O	O	O	O	O	O
RYD104	104	84	150	O	O	O	O	O	O
RYD105	105	85	150	/	/	O	/	/	O
RYD110	110	90	150	O	O	O	O	O	O
RYD115	115	95	150	/	/	O	/	/	O
RYD117	117	95	150	O	O	O	O	O	O
RYD121	121	101	159	O	O	O	O	O	O
RYD125	125	105	179	/	/	O	/	/	O
RYD128	128	108	179	O	O	O	O	O	O
RYD133	133	113	189	O	O	O	O	O	O
RYD139	139	119	189	/	/	O	/	/	O
RYD142	142	122	189	O	O	O	O	O	O
RYD144	144	124	189	/	/	O	/	/	O
RYD152	152	132	205	/	/	O	/	/	O
RYD157	157	132	205	O	O	O	O	O	O
RYD165	165	145	205	O	O	O	O	O	O
RYD169	169	149	205	/	/	O	/	/	O
RYD172	172	149	240	O	O	O	O	O	O
RYD184	184	164	240	O	O	O	O	O	O
RYD192	192	172	240	O	O	O	O	O	O
RYD200	200	180	240	/	/	O	/	/	O
RYD216	216	196	310	O	O	O	O	O	O
RYD227	227	207	370	O	O	O	O	O	O
RYD228	228	207	370	/	/	O	/	/	O
RYD229	229	207	370	/	/	O	/	/	O
RYD240	240	220	450	O	O	O	O	O	O

Maximum of TM planted temperature: the fuse will not change its state, until reaches rated temperature
Holding temperature of TH: it keeps working normally within this scope (the temperature should not be too close to the rated temperature during the installation of fuse, otherwise, misoperation may occur).
Rated action temperature of TF: the tolerance of cut–off temperature are +0-5℃。
Note: if need for safety regulations report, please select models with "O"

Tm最大过载温度：保险丝不会改变状态直到达到这一温度
Th保持温度: 在这范围内正常工作 (在你设计安装保险丝过程中请考虑不能太接近额定动作温度，不然有可能发生误动作)。
TF额定动作温度：可运行的断开温度误差为+0-5度
注意：需要安规报备请选择带O的型号。

PTC SERIES / MZ6型电机保护PTC热敏电阻

General information on PTC thermistors PTC 热敏电阻概述

PTC thermistors acc. to DIN 44081 (triple sensors acc. to DIN 44082) are used to protect electrical machines against thermal overload. Thermistors have an even steeper R/T characteristic as that defined in the DIN standard. The temperature range is from 60 to 180℃. PTC thermistor beads with different rated response temp eratures can be connected in series. This permits an optimal and economic thermal protection of machines and windings with different limit temperatures.

MZ6 型电机保护 PTC 热敏电阻，其关键技术是 90 年从美国引进。现已有十几年的生产经验，该产品可对电机及其它部位进行超温保护。将 PTC 热敏电阻埋置在电机的三相线圈中，当电机线圈的温度接近绝缘等级温度时，其 PTC 热敏电阻阻值升高，此信号传送至 GRB 电机过热保护器中，保护器根据此信号将电机电路断开，从而保护电机，是目前国际上普遍采用的电机保护方式。

Technical Data PTC acc. to DIN 44081/082 技术参数

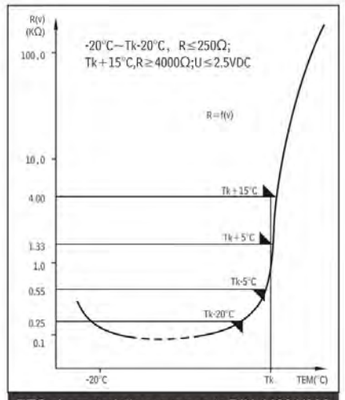
	单芯PTC single	三芯PTC triple	单位
最大直流工作电压 Max. operating voltage	30	30	V
额定动作温度 Rated response temperature Tk	60–180		◦C
Tk的公差 Tolerance of Tk	± 5	± 5	K
Tk的重复性 Reproducibility of Tk	±0.5	±0.5	K
常温阻值R25 Resistance R25	≤100	≤300	Ω
PTC电阻 Tk –5k 在某一温度时 Resistance at a temperature of Tk –5K	≤550	≤1650	Ω
PTC电阻 Tk +5k 在某一温度时 Resistance at a temperature of Tk +5K	≥1330	≥3990	Ω
PTC电阻 Tk +15k 在某一温度时 Resistance at a temperature of Tk+15K	≥4	≥12	kΩ
Tk动作时间 Td Thermal response time Td	≤5	≤5	s
绝缘强度V Insulation test voltage V	AC 2.5	AC 2.5	kV
最高允许工作温度 Max. operating temperature	200	200	◦C
最高允许存放温度 Max. storage temperature	160	160	◦C
最低允许存放温度 Min. storage temperature	–25	–25	◦C
重量 Weight	2	3.5	g

PTC Identification and Part Numbers PTC彩色编码

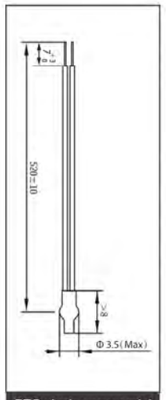
The colour of the connection leads identfies the rated response temperature. These are defined in DIN 44081/082

连接导线的颜色代表不同的温度。PTC 导线颜色编码通过了 DIN44081/44082 国际标准。

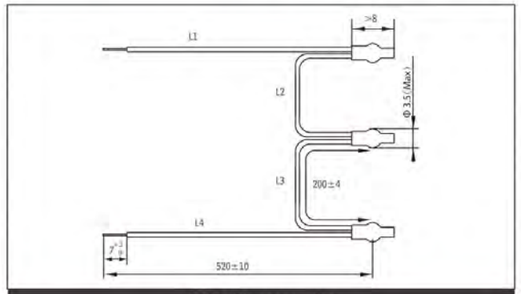
动作温度 Tk (℃)	导线颜色	单芯PTC DIN 44081 编码	三芯 DIN 44082 编码
60	白色/灰色	MZ6–60–E	MZ6–60–D
70	白色/棕色	MZ6–70–E	MZ6–70–D
80	白色/白色	MZ6–80–E	MZ6–80–D
90	绿色/绿色	MZ6–90–E	MZ6–90–D
100	红色/红色	MZ6–100–E	MZ6–100–D
110	棕色/棕色	MZ6–110–E	MZ6–110–D
120	灰色/灰色	MZ6–120–E	MZ6–120–D
130	蓝色/蓝色	MZ6–130–E	MZ6–130–D
140	白色/蓝色	MZ6–140–E	MZ6–140–D
145	白色/黑色	MZ6–145–E	MZ6–145–D
150	黑色/黑色	MZ6–150–E	MZ6–150–D
155	蓝色/黑色	MZ6–155–E	MZ6–155–D
160	蓝色/红色	MZ6–160–E	MZ6–160–D
170	白色/绿色	MZ6–170–E	MZ6–170–D
180	白色/红色	MZ6–180–E	MZ6–180–D



PTC characteristic curve acc. to DIN 44081/082
单芯MZ6型热敏电阻曲线图



PTC single sensor mini
单芯MZ6型热敏电阻



PTC triple sensor mini
三芯MZ6型热敏电阻

Application 特点

PTC thermistors are used to monitor temperature in machines and installations. The design ensures short response times and easy installation.

MZ6型电机保护PTC热敏电阻符合DIN44081/DIN44082国际标准。其体积小（尺寸：1.8 x 0.6mm），反应快，规格齐全，长期使用性能稳定，可靠性高。特别是在电机缺相时能迅速反应，保护电机。

PTC SERIES / GRB型电机过热保护器

General information on motor oveheat protector 概述

GRB overheat protector is designed as a matching for PTC thermistor of MZ6 . When the temperature of the motor coil(or some point on the coil) is over heat, PTC resistance rise. The signal transmits to GRB overheat protector, making a transition in the protector relay. Then the main current cut off to protector the motor.

GRB型电机过热保护器是专为MZ6型电机保护PTC热敏电阻配套使用的产品。当电机线圈温度（或某位置温度）超温时，热敏电阻阻值变大，此信号传送GRB型电机过热保护器中，保护器继电器触点转换，带动控制电路（如电磁开关等）使主电源断开，从而保护了电动机。

Key Benefits 特点

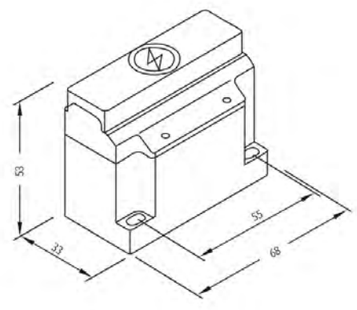
- Advanced technology
- Safety and steady
- High reliability
- Energy Conservation(self consumption power is 0.8VA)
- The shut down temperature can be precisely worked out.

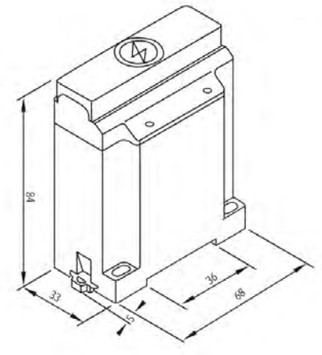
技术先进，工作安全稳定，可靠性高，节能（自身消耗功率为0.8VA），可精确计算出额定关机温度，从而对电机进行可靠的安全保护。

Technical Parameter 技术参数

工作电压 working voltage	24V(AC/DC)	110V AC	220V AC
电压允差 voltage tolerance	± 20%		
频率 frequency	50~60Hz		
消耗功率 consumption power	<0.8VA		
允许环境温度 ambient temperature	–30~70° C		
开关容量 contact rate	7A		
动作电阻 action resistance	单只 single	三只 triple	
	1KΩ×(1 ± 10%)	3KΩ×(1 ± 10%)	
恢复电阻 reset resistance	单只 single	三只 triple	
	500~600Ω	1500~1800Ω	
串联可接热敏电阻数量 No. of connecting PTC thermistors	1~9pcs		
重量 weight	0.20Kg		

Structure 结构图形





Numbering System 型号构成

GRB——□□——□——□

- 串联可接热敏电阻数量 No. of connecting PTC thermistors
- 工作电源电压 working voltage
- B：通断后继电器动作（常开型） normally open
- C：通断后继电器不动作（常闭型） normally close
- 2：高壳 high case
- 3：矮壳 short case
- 过热保护器 overheat protector

PT100/PT1000 SERIES 铂热电阻传感器

BASIC INFORMATION 概述

The Pt100/Pt1000 sensor is used for precise temperature monitoring applications, where errors in measurement have to be excluded. The linear relationship of the resistor to temperature, simplifies its use in many electronic applications. The precision of the Pt100/Pt1000 allows its universal use for temperature monitoring, control and switching in windings, bearings, machines, motors, transformers and many other industrial applications.

铂热电阻是一种精确度高，灵敏度高的传感器，其线性温度阻值优于其他电阻式热传感器，性能稳定，可靠性强。产品分为小型电机用铂热电阻传感器、大型电机用铂热电阻传感器、高压电机用铂热电阻传感器。

GENERAL FUNCTION

The Pt100/Pt1000 sensor is a temperature dependent component.
The resistance of the Pt100/Pt1000 sensor rises linearly with the temperature.

PT100/PT1000传感器是温度元器件，它的阻值和温度变化成线性关系。

KEY BENEFITS 产品优势

- Very precise measuring: measuring temperature ±0.5℃
- Precise linear temperature-resistance characteristic
- Low weight
- Short response time

- 精密度高，测温公差±0.5℃
- 线性温度阻值精密
- 重量轻
- 反应时间快

TECHNICAL DATA 技术参数

- Nominal resistance: 100Ω at 0℃ (Pt100) ,1000Ω at 0℃ (Pt1000)
- Basic thermistor values: for platinum measuring resistors as in chart
- Measuring range: -40℃ to 200℃, other ranges on request
- Measuring current: max.1mA(no self-heating!)
- Circuit: 2-wire 3-wire or customized

- 标称电阻：0℃时100Ω (PT100) ，0℃时1000Ω (PT1000) 。
- 基本热敏电阻值：如测量的铂电阻图表。
- 测温范围：-40℃~200℃，其他温度可定制。
- 测温电流：最大1mA
- 引线：2线，3线或定制。

INSTALLATION GUIDE 安装与使用

Embed the sensor to motor winding,compressing and banding together with the coil,then varnish it.Wire leads is elicited along the shell and fixed in the wiring inside the junction box. Use special Temperature controller for Pt100, Pt1000.

将传感器嵌在电机的绕组内部，压紧绑扎后同线圈一同浸漆，引线沿壳体引出，并固定在接线盒内。使用时，接专用的PT100、PT1000测温仪表。

TOLERANCE 等差允级

Temperature		-100	0	100	200	250	300
Resistance		60.25	100	138.51	175.86	194.10	212.05
Level A	℃	±0.35	±0.15	±0.35	±0.55	±0.695	±0.75
	Ω	±0.14	±0.06	±0.14	±0.20	±0.23	±0.27
Level B	℃	±0.8	±0.3	±0.8	±1.3	±1.58	±1.8
	Ω	±0.32	±0.12	±0.30	±0.48	±0.55	±0.64

CODE SYSTEM 订货示例

WZP—□—□—□—□—□

- 引线长度 (mm)
- Z: 双引线
- D: 三引线
- T: 陶瓷封装
- B: 金属外壳封装
- 传感器直径x长度
- 铂热电阻传感器(Pt100)

PT100 REFERENCE TABLE 分度表

Temperature	0	10	20	30	40	50	60	70	80	90	100
Resistance	100.0	103.90	107.79	111.67	115.54	119.40	123.24	127.08	130.90	134.71	
Temperature	110	120	130	140	150	160	170	180	190	200	
Resistance	142.29	146.07	149.83	153.58	157.33	161.05	164.77	168.48	172.16	175.86	

Note: The resistance of Pt1000 is 10 times as Pt100

TECHNICAL DATA OF PLATINUM SENSOR 技术指标

Model	Temperature range	Graduation Number	Tolerance	Probe material	Size	Resistance at 0℃(Ω)	Thermal response time τ 0.5s
WZP-3×16-T	-40~200℃	Pt100	Level A Level B	Ceramic	φ3×16	100±0.06 100±0.12	<1
WZP-3×16-B	-40~200℃	Pt100	Level B	metal case	φ3×16	100±0.12	<2
WZP-4×32-T	-40~200℃	Pt100	Level A Level B	Ceramic	φ4×32	100±0.06 100±0.12	<2
WZP-4×32-B	-40~200℃	Pt100	Level B	metal case	φ4×32	100±0.12	<3

RoHS ISO9001:2008