

广州安的电子技术有限公司
SafTTY Electronic Technology Co., Limited

ST07 系列热保护器技术规格书
Technical Specifications for ST07 Series Thermal Protector



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Technical Specifications for ST17/17AM Series Thermal Protector

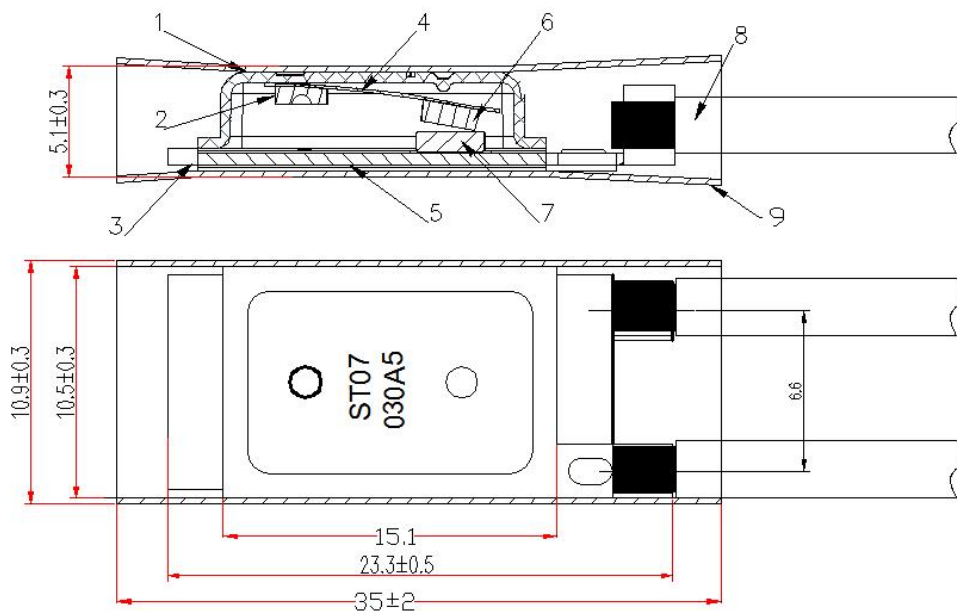
1 产品用途 Product application

ST07 系列热保护器是一种具有对温度和电流双重感应特性的开关。该产品具有体积小、感温速度快、动作灵敏、安全可靠、交直流特性好、寿命长等特点，产品广泛应用于电动工具、吸尘器、电加热器具（电热毯、电磁炉、直发器、电加热棒等）、分马力电机、水泵、镇流器、变压器、开关电源等产品。

The ST07 series thermal protector is a switch with dual sensing characteristics of temperature and current. The product has the characteristics of small size, fast temperature sensitivity, sensitive action, safe and reliable, good AC and DC characteristics, long life, etc., and the products are widely used in electric tools, vacuum cleaners, electric heating appliances (electric blankets, induction cookers, hair straighteners, electric heating rods, etc.), split horsepower motors, water pumps, ballasts, transformers, switching power supplies and other products.

2 外形和结构: Shape and structure

a) 常规品外形和结构 Conventional shape and structure:



| 序号 No. | 零件名称 Part name | 序号 No. | 零件名称 Part name | 序号 No. | 零件名称 Part name |
|-----------|-------------------------|-----------|------------------------|-----------|-------------------------------|
| 1 | 金属外壳 Metal case | 4 | 双金属片 Bimetal-disc | 7 | 定触点 Stationary contact |
| 2 | 铁钉 Iron nails | 5 | 底板 Soleplate | 8 | 导线 Lead wire |
| 3 | 绝缘纸 Insulation paper | 6 | 动触点 Movable contact | 9 | 绝缘套管 Insulation shrink cap |

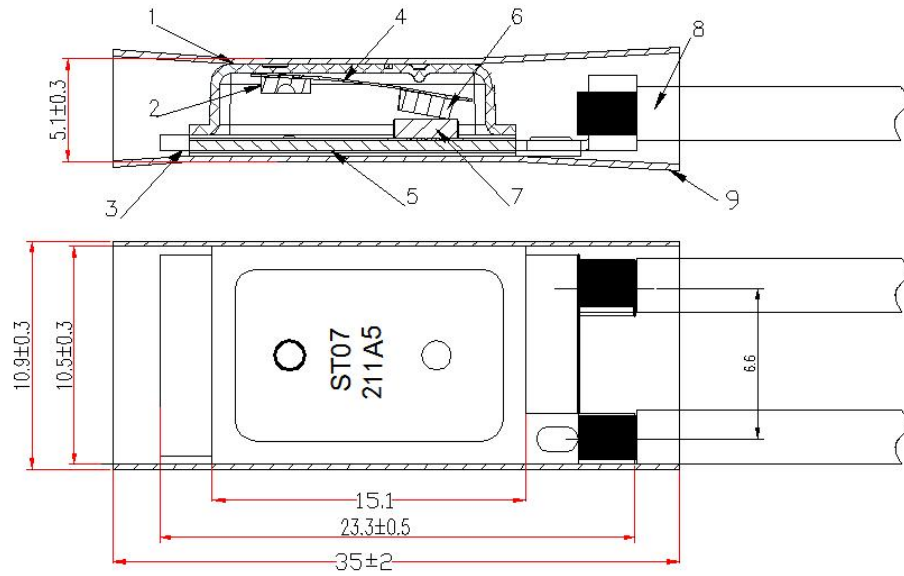
工作原理：

电流通过外壳端子、双金属片，然后由底板端子连接电器（如电机、变压器等）形成回路，当电器发生不正常工作使周围温度过高时，热量传至双金属片达到校正过的跳脱温度使电气触点迅速断开切断电路，当温度下降到复位温度时，双金属片复位又迅速闭合电气触点连通电路，继续循环动作。

Working principle:

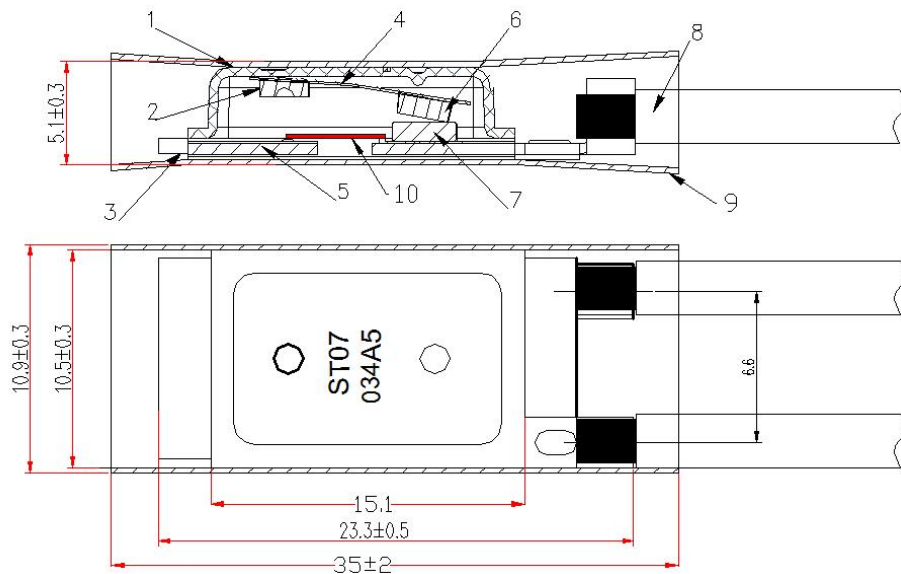
Current through the shell terminals, bimetallic sheet, and then by the base plate terminals connected to the electrical appliances (such as motors, transformers, etc.) to form a loop, when the electrical appliances do not work properly so that the surrounding temperature is too high, the heat transfer to the bimetallic sheet to reach the corrected trip temperature so that the electrical contacts quickly disconnect and cut off the circuit, when the temperature drops to the reset temperature, the Bimetal-disc reset and quickly close the electrical contact connection circuit, continue the cycle action.

b) 高阻双金属片 High resistance bimetallic disc



| 序号 No. | 零件名称 Part name | 序号 No. | 零件名称 Part name | 序号 No. | 零件名称 Part name |
|-----------|-------------------------|-----------|----------------------------------------|-----------|-------------------------------|
| 1 | 金属外壳 Metal case | 4 | 高阻双金属片 High resistance bimetal-disc | 7 | 定触点 Stationary contact |
| 2 | 铁钉 Iron nails | 5 | 底板 Soleplate | 8 | 导线 Lead wire |
| 3 | 绝缘纸 Insulation paper | 6 | 动触点 Movable contact | 9 | 绝缘套管 Insulation shrink cap |

c) 高阻发热丝型 Heating resistance filament type:



| 序号 No. | 零件名称 Part name | 序号 No. | 零件名称 Part name | 序号 No. | 零件名称 Part name |
|-----------|-------------------------|-----------|---------------------------|-----------|--------------------------------|
| 1 | 金属外壳 Metal case | 5 | 底板 Soleplate | 9 | 绝缘套管 Insulation shrink cap |
| 2 | 铁钉 Iron nails | 6 | 动触点 Movable contact | 10 | 发热丝 Heating resistance wire |
| 3 | 绝缘纸 Insulation paper | 7 | 定触点 Stationary contact | | |
| 4 | 双金属片 bimetal-disc | 8 | 导线 Lead wire | | |

工作原理：

电流通过外壳端子、双金属片或辅助发热丝（与底板静触点连接在一起），然后由底板端子连接电器（如电机、变压器等）形成回路，当电器发生电流过大或堵转电流超过保护器设定的跳脱值时，保护器会在设定的时间内切断电源，使电器得到保护；

Working principle:

The current is connected to the electrical appliance (such as a motor, transformer, etc.) through the housing terminals, bimetallic sheet or auxiliary heating wire (connected together with the static contact of the base plate), and then the circuit is formed by the backplane terminals, when the electrical appliance is too large or the stall current exceeds the trip value set by the protector, the protector will cut off the power supply within the set time, so that the appliance is protected.

3 性能（性能数据均为内部实验室测试，供客户参考。客户应根据自己的标准确认是否适用。我们保留在进一步发展过程中做出改变的权利。）

Capabilities (The performance data are all internal laboratory tests for customer reference. Customers should confirm whether it is applicable based on their own standards. We reserve the right to make changes during further development.)

3.1 电气参数

额定交流电压 Rated AC voltage: 250V;

额定直流电压 Rated DC voltage: 16V;

额定电流 Rated current (COSΦ=1.0) : AC 10A;

3.2 动作特性： Performance

3.2.1 额定断开温度 60℃~180℃（详见附表）。

Rated open temperature: 60°C~180°C (details as per attached list)

3.2.2 复位温度（详见附表）。

Reset temperature: (details as per attached list)

3.3 电气强度 Electric strength:

测试仪器为耐压测试仪 the test instrument is high voltage tester.

a. 产品在断开时的引线之间应能承受 AC500V，历时 1min 而无击穿闪络现象；

When the product is in the breaking state, the lead wires should be able to withstand AC500V lasting for 1min without breakdown or flash-over;

b. 产品引线及绝缘外壳之间能承受 AC1500V，历时 1min 而无击穿闪络现象。

The part between the lead wires and the case should be able to withstand AC1500V lasting for 1min without breakdown or flash-over;

3.4 绝缘电阻 Insulation resistance:

在正常条件下，引线及绝缘外壳之间的绝缘电阻在 100MΩ 以上。（所用表计为 DC500V 兆欧表）

Under normal conditions, the insulation resistance between leads (terminal) and case should be more than 100MΩ measured by ohmmeter of DC500V.

3.5 接触电阻 Contact resistance

标准引线长度 55mm 产品的接触电阻应不大于 50mΩ。

The contact resistance of standard lead wire length 55mm products should be lower than 50mΩ.

3.6 抗拉力试验 Tensile resistance test

产品的引线端应能承受大于或等于 50N 静拉力并保持 1 分钟，导线不断裂或松动。

Terminal & leads should endure more than 50N axes direction pull lasting for 1 minute without break or looseness.

3.7 耐高温试验 High temperature test

产品置于高于额定动作温度 30°C 的空气环境中保持 16h，取出放置 2 小时后，检测其温度变化不超过初始值的 ±5°C 或 ±5%，取最大值。

Keep the thermal protector in an incubator which temp. is 30°C higher than its rated switching temperature for sixteen hours, and test it two hours later after taking out from the incubator, while the temperature change does not exceed the initial value of ± 5 °C or ± 5%, returns the maximum value.

3.8 耐低温试验 Low temperature resistance test

产品置于-40℃空气环境中保持 2h，取出放置 2 小时后，检测其温度变化不超过初始值的±5℃或±5%，取最大值。

Keep the thermal protector in a -40℃ incubator for ninety six hours, and test it two hours later after taking out from the incubator, while the temperature change does not exceed the initial value of $\pm 5^{\circ}\text{C}$ or $\pm 5\%$, returns the maximum value.

3.9 抗振试验Anti-Vibration test:

热保护器应能承受振幅 1.5mm，频率变化 10~55Hz，扫描变化周期 3~5 次/min，振动方向 X、Y、Z，每个方向各连续振动 2h，检测其温度变化不超过初始值的±5℃或±5%，取最大值。

Thermal protector should be able to withstand the amplitude 1.5mm, frequency 10-55Hz, scanning change cycles of 3-5 times /min. The vibration direction X, Y, Z and each direction vibrates on a continuous basis for 2 hours while the temperature change does not exceed the initial value of $\pm 5^{\circ}\text{C}$ or $\pm 5\%$, returns the maximum value.

3.10 极限短路试验Short-circuit limit test

产品在串接 RL1-15A 熔断器的电路中承受 200A 的极限短路电流时，应不引起包裹在保护器上的棉花燃烧。

When the thermal protector is in series connection with RL1-15A fuse to withstand short circuit current limit of 200A, it should not cause the cotton burned which is wrapped on the thermal protector.

3.11 跌落试验 Drop test

将产品从 700mm 的高度，自由跌落在水泥平面或其他坚固的水平面上，产品的温度性能不应超过初始值的±5℃或±5%℃（两者值取最大值）。

Let the thermal protector fall free in the cement or other solid surface from a height of 700mm, its temperature performance should not exceed the initial value of $\pm 5^{\circ}\text{C}$ or $\pm 5\%^{\circ}\text{C}$ (take the larger from the two values).

4 产品断开弹跳时间 Product disconnection bounce time

Bounce Time<1ms.

5 其他事项: Others

5.1 断开温度检测的升温速率应控制为 $1^{\circ}\text{C}/1\text{min}$, 用指示灯显示通断状态, 允许通过产品的电流不超过 0.01A 。

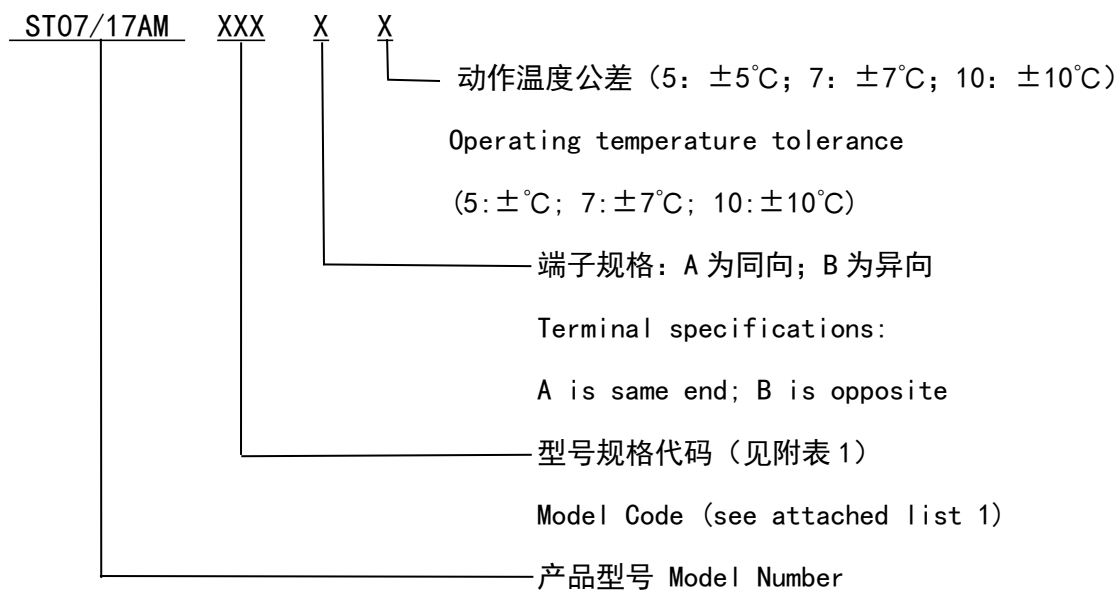
For action temperature testing, temperature rising rate should be controlled at $1^{\circ}\text{C}/\text{min}$ and use indicator light to show the on/off state. The testing current should be no more than 0.01A .

5.2 使用过程中产品不能承受强烈冲击力及压迫力。最大承受压力为 500N。

In your production, the thermal protectors could not withstand a big impact and stress. The maximum bearing pressure is 500N .

5.3 型号规格说明: Model Code System explanation

ST07 027 A5



注: 标准品引为 UL3135, AWG18, 黑色, 引线长 55/55mm, 半剥 6mm。接线方式有同向、反向两种类型, 可依客户要求制定规格或铆接线材和端子;

Standard lead wire is UL3135, AWG18, Black, 55/55mm and semi-stripped 6mm. There are two types of wiring methods: co-directional and reverse, and specifications can be formulated or riveted wires and terminals according to customer requirements;

5.4 包装、储存、运输 Packing, storage and transportation

① 产品包装采用透明塑料自封袋, 每个小包装袋含 100pcs, 每个大包装包含 10 小包, 发货均采用纸箱包装, 尺寸为 $32*26*25\text{CM}$; 如果总数量偏少, 我司会采用其他规格纸箱。

Product packaging using transparent plastic self-sealing bags, each small packaging bag contains 100pcs, each large package contains 10 small packets, the delivery is packed in cartons, the size is 32 * 26 * 25CM; if the total quantity is small, our company will use other specifications of cartons.

② 储存时放于湿度 40%~80%、温度-5~40°C环境中 12 个月无变化；

The product should be stored at the -5~40°C environment with the relative humidity of 40%~80% for 12 months without changes.

③ 直接运输或托运，应轻拿轻放，避免碰撞或受潮。

Direct transportation or shipment, it should be handled carefully and avoid collision or damp.

④ 如有防浸漆要求请在报价前向我司销售人员说明具体要求。

If you products need to suitable for impregnation process, please explain the specific requirements to our sales before quoting.

附表: Attached list

| 型号代码 (低阻双金属片) Model number code (Low resistance bimetal disc) | 型号代码 (高阻双金属片) Model number code (High resistance bimetal disc) | 动作温度 (°C) Operating temperature (°C) | 复位温度 (°C) Reset temperature (°C) |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------|----------------------------------------|
| 019 | - | 60 | 45±15 |
| 020 | - | 65 | 50±15 |
| 021 | 201 | 70 | 50±15 |
| 022 | 202 | 75 | 55±15 |
| 023 | 203 | 80 | 55±15 |
| 024 | 204 | 85 | 60±15 |
| 025 | 205 | 90 | 60±15 |
| 026 | 206 | 95 | 65±15 |
| 027 | 207 | 100 | 65±15 |
| 028 | 208 | 105 | 70±15 |
| 029 | 209 | 110 | 70±15 |
| 030 | 210 | 115 | 75±15 |
| 031 | 211 | 120 | 75±15 |
| 032 | 212 | 125 | 80±15 |
| 033 | 213 | 130 | 85±15 |
| 034 | 214 | 135 | 85±15 |
| 035 | 215 | 140 | 90±15 |
| 036 | 216 | 145 | 95±15 |
| 037 | 217 | 150 | 95±15 |
| 038 | 218 | 155 | 100±15 |
| 039 | 219 | 160 | 105±15 |
| 040 | - | 165 | 110±15 |
| 041 | - | 170 | 115±15 |
| 042 | - | 175 | 120±15 |
| 043 | - | 180 | 125±15 |