

MAE SERIES



IP67 Waterproof Micro switch

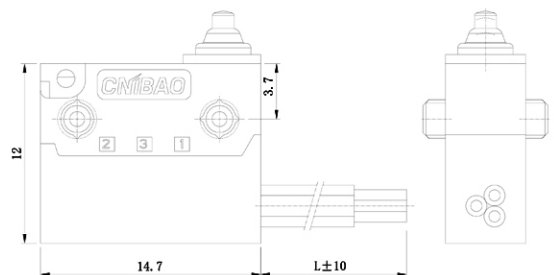
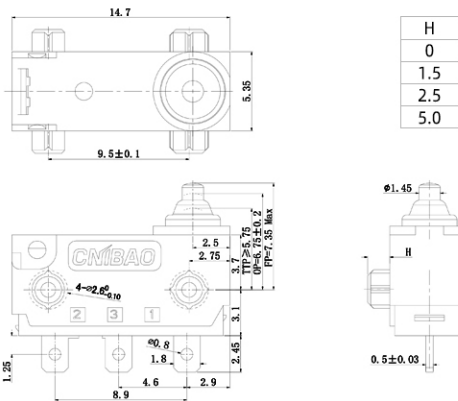
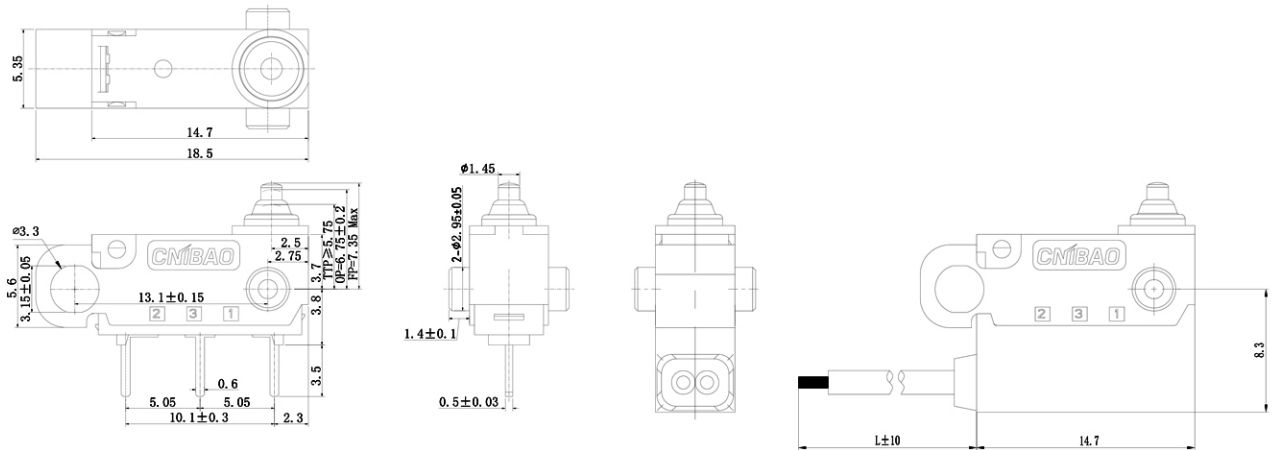
特点 FEATURE

使用寿命长、可靠性高 · Long Life and High Reliability
 防水设计 (IP67) · Designed For Waterproof IP67
 体积小, 安装简易、方便
 拥有多种安规认证配置多样型式压杆
 端子规格齐全 · Complete Variety of Wiring Terminal
 多种安装外形, 满足不同安装要求
 Various Dimensions Satisfy Different Installation Requirements
 配置多种线束与接插件

应用 APPLICATION

汽车电子应用
 空调 · Air-Conditioner
 通讯 · Communication
 家用电器 · Home Appliance
 电机控制器 · Motor Control
 共享设备 · Sharing Device
 玩具 · Toys
 充电桩 · Charging Station



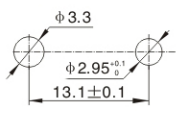
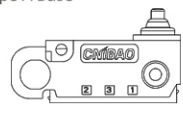
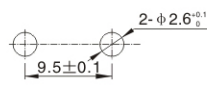

外形尺寸图 OUTLINE DRAWING



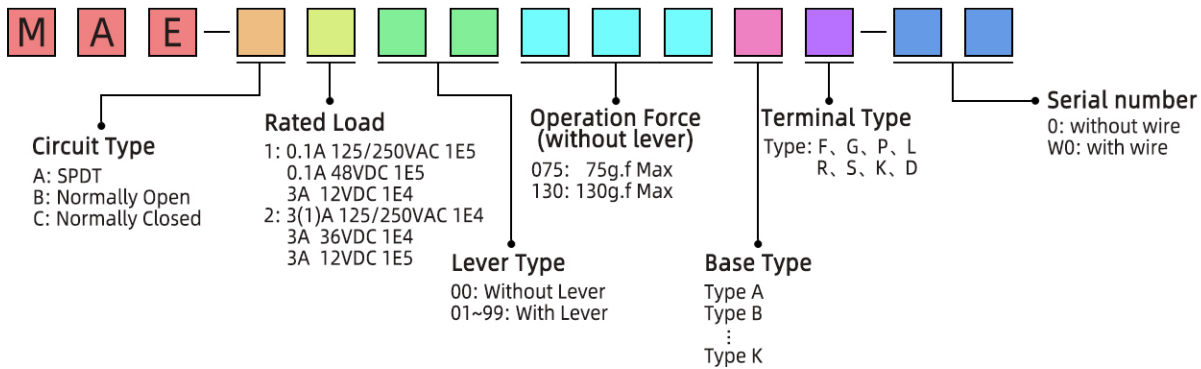
* Wire standards can be customized according to customer requirements, The wire outlet direction can be side or lower.

* 线材标准可以根据客户要求定制, 出线方向可选侧出线或下出线。

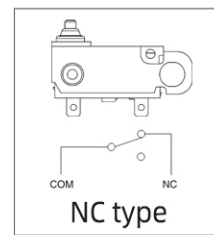
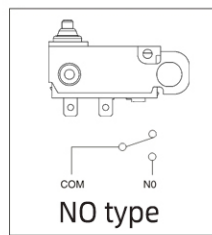
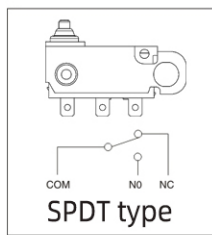
特性参数 PARAMETERS

额定负载/Rated Load	0.1A 125/250VAC 1E5 0.1A 48VDC 1E5 3A 12VDC 1E5 3A 36VDC 1E4 3(1)A 125/250VAC 1E4	3(1)A 125/250VAC 1E4 0.1A 125/250VAC 1E5 3A 12VDC 36VDC 1E5 0.1A 48VDC 1E5	 
初始接触电阻/Initial Contact Resistance	100mΩ Max (不含线束和电阻 Without wire or resistance)		
环境温度/Working Temperature	40T85		
寿命/Service Life	电气/Electrical	10,000 Cycles 100,000 Cycles	
	机械/Mechanical	1,000,000 Cycles	
安装尺寸/HOLE FOR MOUNTING	<p>A型外壳 Type A Base</p>  		<p>带柱型外壳 Type C ~ Type K Bases</p>  

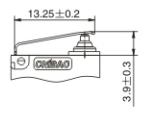
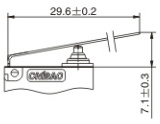
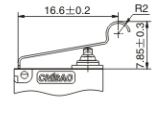
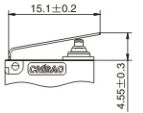
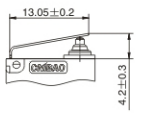
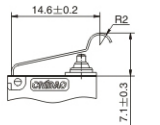
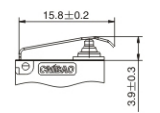
订货型号指引 ORDERING INSTRUCTION

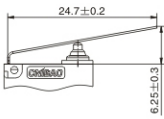
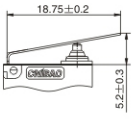
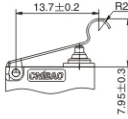
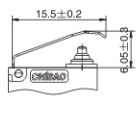
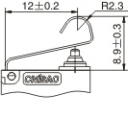
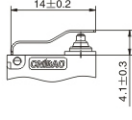
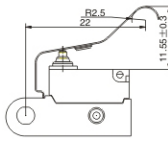
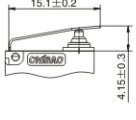
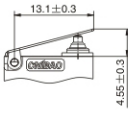
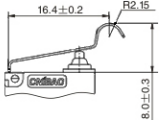
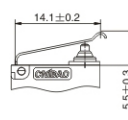
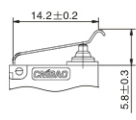


● 电路形式 Circuit type



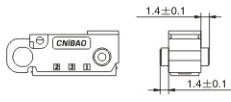

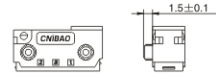
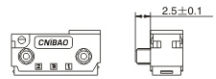
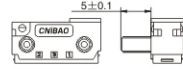
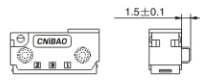
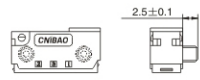
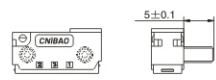
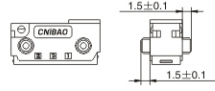
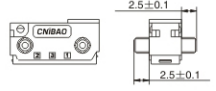
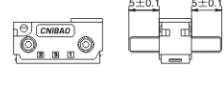
● 手柄类型 Lever type

00	Without Lever	01		02		03	
04		05		06		07	

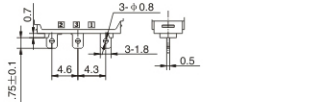
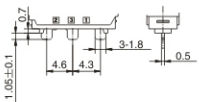
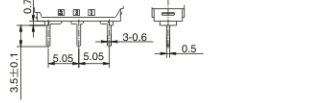
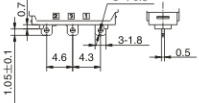
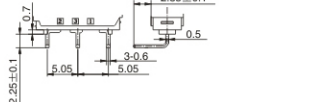
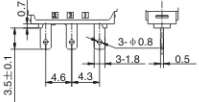
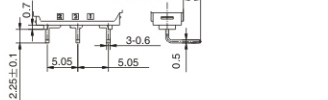
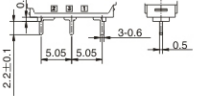
08		09		10		11	
12		13		14		15	
16		17		18		19	

※ For more lever types, please contact us, We accept paid customization.

● 外壳类型 Base type

A		B		C		D	
E		F		G		H	
I		J		K		...	For more Base types, please contact us, We accept paid customization.

● 端子类型 Terminal type

F		G	
P		S	
L		K	
R		D	

※ For more terminal types, please contact us, We accept paid customization.

开关参数规格 SWITCH SPECIFICATION

● 一般特性 General

适用范围 Application Area:

该规格书指微动开关 (MAE系列) 的一般使用范围

This specification refers to the general use of micro switch MAE series

使用温度范围 Operation Temperature rating : -40°C to +85°C

相对湿度 Operation Relative Humidity : ≤85% at +40°C

实验条件 Test conditions:

环境湿度 Ambient Temperature : 5~35°C

相对湿度 Relative Humidity: 45~85%

大气压力 Air Pressure: 86~106Kpa(860~1060mbar)

操作频率 Operation frequency:

带电气负载: 20次/分最大 20 operations/minute max(electrical)

机械操作: 60次/分最大 60 operations/minute max(mechanical)

● 外观结构及尺寸 Appearance, Configuration and Dimensions

外观: 产品外观良好, 无锈蚀、裂纹和镀层缺陷

Appearance: Product appearance and no rust, crack and coating defects

结构尺寸 Structur and Dimension: 参见产品图纸 See the outline drawing

标识 Sign: 参见产品图纸 See the outline drawing

通过的安规认证 Safety Certification: RoHS,REACH,CQC,TUV,CE

产品防护等级 Degree of protection: IP67(Except terminal)

● 电气性能 Electrical characteristic

No.	Item 项目	Criteria 标准	Test Method 实验方法
1	Insulation Resistance 绝缘电阻	100M ohm min	500VDC voltage is applied between each pair of terminals and between the terminal and the metal frame for 60±5S. 在相互绝缘的所有端子之间及各接线端子与外露的非载流金属零件之间加载 500V 直流电, 持续时间 60±5S。
2	Dielectric Voltage 抗电强度	No dielectric breakdown shall occur. 无击穿现象发生。	250V(50-60HZ, 10mA)alternate current load is applied between open terminals connected with wires; or 500V(50-60HZ,10mA) alternate current load is applied between frame and terminal or between metal parts, for 60 ± 5 Sec. 在相互绝缘的所有接线端子之间加载 250V(50-60Hz, 泄漏电流 10mA)交流电, 各接线端子与外壳或非载流金属零件之间加载 500V(50-60Hz, 泄漏电流 10mA)交流电, 持续时间 60±5 秒。

● 机械性能 Mechanical characteristic

No.	Item 项目	Criteria 标准	Test Method 实验方法
1	Terminal Strength 接线端强度	After test: Shall be free from terminal looseness, damage and insulator breakage. The electrical performance requirements specified shall be satisfied. Switch appearance and structure should be free from damage. 实验后: 端子无松动, 损坏及绝缘层的破裂; 应符合规定的电气性能要求。 开关外观及结构应无损坏。	A static load of 1255gf/12N shall be applied to the tip of terminal in a desired direction for 60 ± 1s. The test shall be done once per terminal. 以 1255gf/12N 作用力沿轴向逐渐施加于接线端末端, 作用力方向为离开开关向外指向并保持 60±1s, 每个接线端子测量一次。

No.	Item 项目	Criteria 标准	Test Method 实验方法
2	Solder Ability 可焊性	<p>After test: More than 90% of immersed part shall be covered with solder. The electrical performance requirements specified shall be satisfied. Switch appearance and structure should be free from damage.</p> <p>实验后: 超过 90%的浸锡面积被焊料所覆盖; 应符合规定的电气性能要求。 开关外观及结构应无损坏。</p>	<p>Switch shall be measured after following test:</p> <p>(1) Solder: H63A (JIS Z3282) (2) Flux: Rosin Flux (JIS K 5902) having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Soldering Temperature & Immersing Time Dip Soldering: 235±5°C 3±0.5sec Manual Soldering: 350±5°C 2~3s (4) Immersion Depth: (For Dip Soldering) Immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm)</p>
3	Solder Heat Resistance 耐焊接热	<p>After test: The electrical performance requirements specified shall be satisfied. Switch appearance and structure should be free from damage.</p> <p>实验后: 应符合规定的电气性能要求。 开关外观及结构应无损坏。</p>	<p>试件在下述参数条件下进行试验:</p> <p>(1) 焊料: H63A (JIS Z 3282) (2) 焊剂: 焊剂 (JIS K 5902), 质量百分比为 25%松香, 75% 甲醇的无色透明溶液。 (3) 焊接温度及浸渍时间: 自动焊接: 235±5°C 3±0.5sec 手工焊接: 350±5°C 2~3s (4) 浸渍深度: (对于手动焊接) 接线端应浸到离开开关根部 1.6mm 处。</p>
4	Resistance to Flux 抗焊剂能力	<p>After test: Flux shall not be risen up to contact. The switch shall be free from abnormalities in operation.</p> <p>实验后: 焊剂不得上升进入开关内部, 影响接触转换。 试件在操作过程中不应发生变形。</p>	<p>Switch shall be checked after following test:</p> <p>(1) Equipment: Auto-Dip Chamber (2) Solder: H63A (JIS Z3282) (3) Flux: Rosin Flux (JIS K 5902) having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol (JIS K1501) solution. (4) Soldering Temperature: 235 ± 5° C (5) Immersing Time: 3 ± 0.5s (6) Immersion Depth: Immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm)</p> <p>试件在下述参数条件下进行试验:</p> <p>(1) 设备: 自动焊接机 (2) 焊料: H63A (JIS Z 3282) (3) 焊剂: 焊剂 (JIS K 5902), 质量百分比为 25%松香, 75% 甲醇的无色透明溶液。 (4) 焊接温度: 235±5°C (5) 浸渍时间: 3±0.5s (6) 浸渍深度: 接线端应浸到离开开关根部 1.6mm 处。</p>
5	Post vibration waterproofin 振动后防水	<p>After test: Insulation resistance: 10 M Ω Min; Electrical strength: meets the requirements of electrical performance clause 2; Switch appearance and structure should be free from damage.</p> <p>实验后: 绝缘电阻: 10MΩ Min; 抗电强度: 符合电气性能第 2 条的要求; 开关外观及结构应无损坏。</p>	<p>After vibration test, according to IEC60529 method. 振动后测试, 参照 IEC60529 方法。</p>

● 寿命试验 Life test

No.	Item 项目	Criteria 标准	Test Method 实验方法
1	Mechanical Life 机械寿命	After test: Insulation resistance: 10M Ω Min; Electrical strength: meets the requirements of electrical performance clause 2; Switch appearance and structure should be free from damage. 实验后: 绝缘电阻: 10MΩ Min; 抗电强度: 符合电气性能第 2 条的要求; 开关外观及结构应无损坏。	1,000,000 cycles of operation shall be performed continuously at a rate of 60 cycles per minute without load. 在不带负荷的条件下, 速度为 60 次/分, 在寿命试验设备上连续转换 1,000,000 次。
2	Electronics Life 电气寿命		operation shall be performed continuously at a rate of 10-20 cycles per minute with load as follow 在带以下负荷的条件下, 速度为 10-20次/分, 在寿命试验设备上连续转换。 3A 12VDC 1E4 0.1A 48VDC 1E5 0.1A 250VAC 1E5

● 耐候实验 Environmental test

No.	Item 项目	Criteria 标准	Test Method 实验方法
1	Cold Proof 低温	After test: Insulation resistance: 10M Ω Min; Electrical strength: meets the requirements of electrical performance clause 2; Switch appearance and structure should be free from damage. 实验后: 绝缘电阻: 10MΩ Min; 抗电强度: 符合电气性能第 2 条的要求; 开关外观及结构应无损坏。	After testing at $-40 \pm 2^\circ \text{C}$ for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 2 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件在 $-40 \pm 2^\circ \text{C}$ 的温箱内保持 96h, 然后在正常温度和湿度下恢复 2h, 并在此后 1h 内对试品进行测量, 水滴应消失。
2	Hot Proof 高温		After testing at $85 \pm 2^\circ \text{C}$ for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 2 hour, and measurement shall be made within 1 hour after that. 试件在 $85 \pm 2^\circ \text{C}$ 的温箱内保持 96h, 然后在正常温度和湿度下恢复 2h, 并在此后 1h 内对试品进行测量, 水滴应消失。
3	Moisture Resistance 恒温湿热		After testing at $40 \pm 2^\circ \text{C}$, 90~95% RH for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 2 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件在 $40 \pm 2^\circ \text{C}$, 90-95%RH 的温控箱内保持 96h, 然后在正常温度和湿度下恢复 2h, 并在此后 1h 内对试品进行测量, 水滴应消失。
4	Temperature Cycling 温度转换		After 5 cycles of following conditions, the switch shall be allowed to stand under normal temperature and humidity conditions for 2 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件按下述实验条件试验 5 次, 然后在正常温度和湿度下恢复 2 小时, 并在此后 1h 内对试品进行测量, 水滴应消失。

