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<b>Title : Ball switch</b>				

Rated Voltage (Maximum)额定电压	<12V
Rated Current (Maximum)额定电流	<20mA
Operating temperature range工作温度范围	-10℃~+100℃ From -10 to +100 degree centigrade
Storage Temperature Range储存温度范围	-20℃~+60℃ From -20 to +60 degree centigrade

## 5. TEST STANDARD (测试条件)

5.1 Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows (除另有说明外, 用以进行测量和测试的标准环境条件范围如下)

Ambient temperature(环境温度): 5℃ to 35℃

Normal humidity (正常湿度): 45% to 85%

Air pressure (气压): 86Kpa to 106Kpa

5.2 However if doubt arises on the decision based on the measured Values under the above-mentioned Conditions. The following conditions shall be employed:

(但是在对判定产生疑问时,按下述状态实施)

Temperature (温度): 20±2℃


Relative humidity (相对湿度): 65±5%

Air pressure (气压): 86Kpa to 106Kpa

## 6. PERFORMANCE AND TEST DESCRIPTION (性能和测试类型)

### 6.1 APPEARANCE (外观)

ITEM	DESCRIPTION (类型)	TEST CONDITION (测试条件)	REQUIREMENT (要求)
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1	<b>Appearance</b> (外观)	<b>Visual.</b> (目视)	<b>The switch shall have good finishing, and no rust, crack or plating defects (产品外观良好, 无锈蚀、裂纹和镀层缺陷)</b>
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## 6.2 ELECTRICAL (电气)

ITEM	DESCRIPTION (类型)	TEST CONDITION (测试条件)	REQUIREMENT (要求)
1	<b>Insulation Resistance.</b> (绝缘电阻)	<b>A voltage of DC5V shall be applied between open terminals, and between the terminal and the metal frame for 60±5Sec.</b> (在相互绝缘的所有端子之间及各接线端子与金属外壳之间载入 DC5V, 持续时间 60±5 秒)	<b>Closed circuit resistance (闭路电阻) :&lt; 10 mΩ</b> <b>Open circuit resistance (开路电阻) :&gt; 10 MΩ</b>
2	<b>Dielectric Voltage</b> (耐电压)	<b>A voltage of AC 100V(50-60HZ),2mA trip current shall be applied between open terminals, and between the frame and the terminal for 60±5Sec.</b> (在相互绝缘的所有接线端子之间及各接线端子与金属外壳之间载入 AC110V (50-60HZ), 2mA, 持续时间60±5秒)	<b>No insulation defect shall be observed: and no dielectric breakdown shall occur.</b> (试验后, 无绝缘性不良的现象: 无击穿现象发生)
3	<b>Capacitor (电容量)</b>	<b>Capacitor shall be measured at 10KHz/1.0V, and machine is LY2810 LCR digital galvanothermy tester.</b> (以频率 10KHz/电压 1.0 V 作为电容档调试参数值, 采用 LCR 数位电桥测试仪 (LY2810) 测量, 直接读数)	<b>1.When there is an electric current between the circuit terminals (当回路端子之间出现电流时, 电容量为): 500-750 u F</b> <b>2.When there is no current between the circuit terminals (当回路端子之间未出现电流时, 电容量为): 3.0-5.0 p F</b>

## 6.3 MECHANICAL (机械)

ITEM	DESCRIPTION (类型)	TEST CONDITION (测试条件)	REQUIREMENT (要求)
1	<b>Terminal strength</b> (接线端强度)	<b>A static load of 1Kgf(9.8N) shall be applied to the tip of terminal in an optional direction for 1 min. the test shall be done the three per terminal.</b> (以 1Kgf (9.8N) 作用为沿可选择的方向逐渐施加于接线端末端, 保持 60 秒。每个接线端子测量三次)	<b>Shall be free from terminal looseness damage and insulator breakage.</b> (端子无松动, 损坏及绝缘层的破裂) <b>The electrical performance requirements specified in section 6.2 shall be satisfied.</b> (电气性能应符合第 6.2 部分的要求)

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2	<b>Durability (负荷寿命)</b>	<p>20,000 cycles of operation shall be performed continuously at a rate of 15~20 cycles per minute and rotating angle 10° one cycle with DC 5V 1m A load. (在带负荷 DC 5V 1m A 的条件下, 在寿命试验设备上按 10° 旋转来回切换方式, 以频率为 15~20 次/分钟 连续转换 20,000 次。)</p> 	<p>After test (实验后): The electrical performance requirements specified in section 6.2 shall be satisfied. (电气性能应符合第 6.2 部分的要求) The sensor shall be free from abnormal in appearance&amp;construction. (感应器外观及结构应无损坏)</p>
3	<b>Mechanical Life (机械寿命)</b>	<p>20,000 cycles with unload. (在无负荷条件下, 在寿命试验设备上按 10° 旋转来回切换方式, 以频率为 120~180 次/分钟连续转换 20,000 次。)</p>	
4	<b>Vibration characteristic (振动特性)</b>	<p>Amplitude (振幅): 1.5mm Sweep Rate (频率): 10~55~10Hz about 1 minute Sweep Logarithmic frequency or liner sweep (按每分钟内 10~55~10Hz 呈线性或对数曲线性) Sweep direction (周期): Vertical 3 directions (互相垂直 3 方向) Examination hours 2 hours (total 6 hours) (每方向振动试验 2 小时 (共6小时))</p>	<p>The electrical performance requirements specified in section 6.2 shall be satisfied. (电气性能应符合第 6.2 部分的要求) The sensor shall be free from abnormalities in appearance&amp;construction. (感应器外观及结构应无损坏)</p>

#### 6.4 ENVIRONMENTAL (环境)

ITEM	DESCRIPTION (类型)	TEST CONDITION (测试条件)	REQUIREMENT (要求)
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1	Solder ability (可焊性)	<p>Switch shall be checked after following test. (滚珠开关在下述参数条件下进行试验) :</p> <p>(1). Solder (焊料) : Sn-3Ag-0.5Cu          (2). Flux (焊剂) : Rosin Flux JIS K 5902          (3). Soldering temperature (焊接温度) : 245±5°C          (4). Immersing time (焊接时间): 3±0.5sec</p>	More than 90% of immersed part shall be covered with solder. (超过90%的焊锡面积被焊料所覆盖)												
2	Resistance to Soldering heat (焊锡耐热性)	<p>Switch shall be checked after following test (滚珠开关在下述参数条件下进行试验) :</p> <p>(1). Solder (焊料) : Sn-3Ag-0.5Cu          (2). Flux (焊剂) : Rosin Flux JIS K 5902          (3). Soldering temperature and immersing time (焊接时间及温度) :</p> <table border="1" data-bbox="587 936 1102 1301"> <tr> <td>烙铁 Soldering Iron</td> <td>380 ± 10°C</td> <td>3 sec Max</td> </tr> <tr> <td>量产时自动焊接</td> <td>预热温度 Pre heat &lt; 110°C</td> <td>时间 60sec Pre heat &lt;</td> </tr> <tr> <td>Auto-soldering during mass production</td> <td>焊接温度 Solder temperature &lt; 260 °C</td> <td>焊接时间 Solder time &lt; 3s</td> </tr> <tr> <td>推荐波峰焊条件 Wave soldering is recommended</td> <td></td> <td>基板厚度: 1.60mm</td> </tr> </table>	烙铁 Soldering Iron	380 ± 10°C	3 sec Max	量产时自动焊接	预热温度 Pre heat < 110°C	时间 60sec Pre heat <	Auto-soldering during mass production	焊接温度 Solder temperature < 260 °C	焊接时间 Solder time < 3s	推荐波峰焊条件 Wave soldering is recommended		基板厚度: 1.60mm	No abnormalities shall be observed in appearance and operation. The electrical performance. (无外观及功能损坏, 电气性能应符合第 4 部分要求)
烙铁 Soldering Iron	380 ± 10°C	3 sec Max													
量产时自动焊接	预热温度 Pre heat < 110°C	时间 60sec Pre heat <													
Auto-soldering during mass production	焊接温度 Solder temperature < 260 °C	焊接时间 Solder time < 3s													
推荐波峰焊条件 Wave soldering is recommended		基板厚度: 1.60mm													
3	Cold Proof (耐低温)	<p>After testing at -30±°C for 96 hours, the Switch shall be allowed to stand under 2 hours, and then measurement shall be made within 1 hours, water drops shall be eliminated. (滚珠开关在-30±°C的温控箱内保持 96 小时, 然后在正常温度和湿度下恢复 2 小时, 并在些后 1 小时内对滚珠开关进行测量, 水滴应消失)</p>	After test (实验后) : The sensor shall be free from abnormalities in appearance & construction. (开关外观及结构应无损坏)												
4	Hot Proof (耐高温)	<p>After testing at 70±2°C for 96 hours, the sensor shall be allowed to stand normal room temperature and humidity conditions for 2 hours, and then measurement shall be made within 1 hour. (滚珠开关在 70±2°C的温控箱内保持 96 小时, 然后在正常温度和湿度下恢复 2 小时, 并在些后 1 小时内对此产品进行测量)</p>	The electrical performance requirements specified in section 6.2 shall be satisfied. (电气性能应符合第 6.2 部分的要求)												

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5	<b>Moisture Resistance(耐湿性)</b>	<p>After testing at 40±2°C,90-95%RH for 96 hours, the sensor shall be allowed to stand normal room temperature and humidity conditions for 2 hours, and then measurement shall be made within 1 hour. Water drops shall be eliminated. (滚珠开关在 40±2°C, 90-95%RH 的温控箱内保持 96小时, 然后在正常温度和湿度下恢复 2 小时, 并在些后 1 小时内对滚珠开关进行测量, 水滴应消失)</p>	<p>After test (实验后) : The sensor shall be free from abnormalities in appearance &amp; construction. (开关外观及结构应无损坏) The electrical performance requirements specified in section 6.2 shall be satisfied. (电气性能应符合第 6. 2部分的要求)</p>
6	<b>Temperature Cycling(温度循环)</b>	<p>After 5 cycles of following conditions, the switch shall be allowed to stand under normal room temperature and humidity conditions for 2 hours, and then measurement shall be made within 1 hour. Water drops shall be eliminated. (滚珠开关按上述实验条件试验 5个循环, 然后在正常温度和湿度下恢复 2小时, 并在些后 1小时内对滚珠开关进行测量, 无水滴)</p>	
7	<b>Salt Spray Test(盐雾试验)</b>	<p>The part of switch shall be subjected to a fine mist of a solution at a temperature of 35±2°C for 12 hours continuously (salt solution concentration 5±1% by weight) 部件放置在温度为 35±2°C、浓度为 5±1%的盐雾中做腐蚀试验, 保持 12 小时。)</p>	<p>Appearance shall no rust, oxidation, corrosion and other undesirable phenomena. (外观须无生锈、氧化、腐蚀等不良现象)</p>
8	<b>Hand Soldering (手工焊接)</b>	<p>Please practice according to bellow conditions: (请按以下条件进行焊接) (1) Soldering temperature焊锡温度: ≤350°C (2) Continuous soldering time连续焊接时间: ≤3 S (3) Capacity of soldering iron电烙铁的功率: ≤60 W</p>	<p>Should not have any flaw scratch and crack. (无任何裂痕、刮伤和破裂)</p>

## 7. OTHER PRECAUTIONS 其他注意事项:

- 7.1. Following the soldering process, do not try to clean the switch with a solvent or the like.  
进行焊接过程中, 不可以用溶剂或类似品清洗开关
- 7.2. Safeguard the switch assembly against flux penetration from its topside.

