

SPECIFICATION

(产品规格书)

CUSTOMER : _____

(客户)

PARTNO. : 28BYJ48-W03

(型号)

DATE : 2019.06.03

(日期)

CUSTOMER APPROVED (客户确认)	
料号/Part No.	签章/Signatures

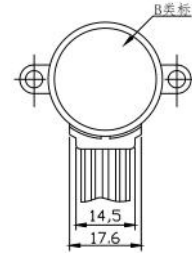
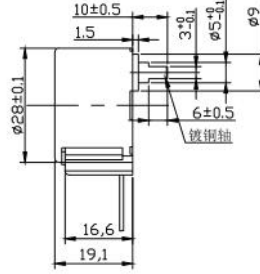
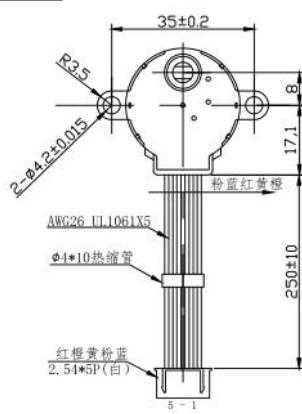
作成/Drawn	
审核/Check	
批准/Approved	

客户 (USER)												
型号 (MODEL)	28BYJ48-W03	图号 (DWG.No.)										
(1)	电性能及参数 (ELECTRICAL PERFORMANCE AND PROPERTIES)											
1-1	相数 Number of phase	4 相 4 phase										
1-2	驱动方式 Drive mode	1-2 相励磁单极驱动 1-2 phase excitation unipolar drive										
1-3	步距角 Step angle (output shaft)	5.625 ⁰ /64 (输出轴), 减速比 1/64 5.625 ⁰ /64 (output shaft) ,gear reduction ration1/64										
1-4	电压 Voltage	12VDC(电机端子) 12VDC(motor energized voltage)										
1-5	线圈电阻 Resistance per phase	200 Ω ±7%/相 25°C 200 Ω ±7%/phase at 25°C										
1-6	最大空载牵出频率 Max response frequency	>1000pps >1000pps										
1-7	最大空载牵入频率 Max starting frequency	>500pps >500pps										
1-8	牵入转矩 Pull in torque	>600gf.cm / 12VDC 400pps >600gf.cm / 12VDC 400pps										
1-9	绝缘电阻 (Insulation resistance) 在引接线和外壳之间施加 500VDC, 测得绝缘电阻大于 50MΩ。 Insulation resistance between motor leadwire and dead metal parts shall be over 50MΩ measured with 500 VDC megaohmmeter.											
1-10	电气强度 (Dielectric breakdown of insulation) 在引接线和外壳之间施加 50/60Hz 600VAC, 时间 1 分钟, 泄漏电流设置为 1mA, (或 50/60 Hz 500VAC, 时间 1 秒钟, 泄漏电流设置为 1mA), 应无击穿或闪络。 following condition and requirement. Product shall show no abnormality.											
	<table border="1"> <thead> <tr> <th>Applied voltage</th> <th>Time</th> <th>Leak current</th> </tr> </thead> <tbody> <tr> <td>600 VAC 50/60Hz</td> <td>1 second</td> <td>1 mA</td> </tr> <tr> <td>Or 500 VAC 50/60 Hz</td> <td>1 minute</td> <td>1 mA</td> </tr> </tbody> </table>			Applied voltage	Time	Leak current	600 VAC 50/60Hz	1 second	1 mA	Or 500 VAC 50/60 Hz	1 minute	1 mA
Applied voltage	Time	Leak current										
600 VAC 50/60Hz	1 second	1 mA										
Or 500 VAC 50/60 Hz	1 minute	1 mA										
1-11	电机绕阻温升 (Temperature rise of motor bobbin coil) 电机在 12VDC 100HZ, 空载运行条件下, 电机温升达到稳定状态时, 用电阻法测量电机温升应不大于 50K。 Temperature rise of motor bobbin coil shall not exceed 50 deg K when operated in no load condition at 12VDC and 100pps (pulse per sec)until temperature rise of motor bobbin coil gets constant,measured by resistance method.											
(2)	机械特性 (MECHANICAL PERFORMANCE AND PROPERTIES)											
2-1	外观 (Outside view) 电机在规定使用状态下, 应无影响使用的生锈, 变形等缺陷。 Outside view shall be free from any damage and discoloration which may cause failure at rated operating conditions.											

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2-2	电机结构及尺寸 (Motor structure and size) 电机外形，结构及尺寸应符合图纸要求 Outside view, structure and size shall match the drawing.						
2-3	重量 (Weight) 电机重约 35 克 Product shall weight about 35 g.						
2-4	输出轴摩擦力矩 (Frictional torque of output shaft) 输出轴摩擦力矩为 1800—2400gf.cm. Frictional torque shall be as follows 1800—2400gf.cm						
2-5	噪音 (Noise level) 电机在 12VDC/100Hz 条件下空载运行，距电机 10cm 处测得噪音值不大于 40dB Noise level of motor shall be less than 40 dB energized with 12VDC and 100 pps in no load condition, measured 10 cm from motor.						
2-6	输出轴强度 (Shaft Strength) 径向强度 承载 2kgf 以上历时 10 秒。 Radial strength more than 2 kgf without failure for 10 sec. 抗拉强度 承载 2kgf 以上历时 10 秒。 Pull out strength more than 2 kgf without failure for 10 sec. 抗压强度 承载 2kgf 以上历时 10 秒。 Push out strength more than 2 kgf without failure for 10 sec.						
2-7	引出线抗拉强度 (Leadwire pulling strength) 电机和引出线之间 承载大于 1kgf 历时 10 秒 (初回，静负荷) Motor and leadwire more than 1kgf/strand. 引出线和端子之间 承载大于 1kgf 历时 10 秒 (初回，静负荷) Leadwire and connector more than 1kgf/strand.						
2-8	齿轮运行强度 (Gear post strength) 30 个循环耐久试验后，齿轮应无阻滞，卡死等现象。1 个循环包括输出轴以 180°/秒的速度正反方向旋转。 Gear post shall withstand without mechanical failure through 30 cycle endurance test. 1 cycle comprised of 180° back and forth rotation of output shaft at speed of 1 second.						
2-9	自定位转矩 (Detent torque) 电机在不通电状态下自定位转矩应大于 500gf.cm Static detent torque shall be more than 500gf.cm measured with pulley weight method.						
(3)	环境性能 (ENVIRONMENTAL PERFORMANCE AND PROPERTIES)						
3-1	使用条件如下 (Operating condition shall be as follows): <table border="1" data-bbox="483 1653 1329 1738" style="margin-left: 40px;"> <tr> <td>温度 (Temperature)</td> <td>-20℃~60℃</td> </tr> <tr> <td>相对湿度 (Relative Humidity)</td> <td>35%~85%</td> </tr> </table>			温度 (Temperature)	-20℃~60℃	相对湿度 (Relative Humidity)	35%~85%
温度 (Temperature)	-20℃~60℃						
相对湿度 (Relative Humidity)	35%~85%						
	在此条件下，电机应能满足 1-5, 1-9, 1-10, 1-11, 2-1, 2-3, 2-5, 的要求。 Motor shall satisfy requirements in 1-5, 1-9, 1-10, 1-11, 2-1, 2-2, 2-3, 2-5 in operating conditions.						
3-2	保存条件 (Storage conditions) 保存温度 -20℃~60℃或 80℃小于 48 小时 Storage temperature -20℃~60℃.or 80℃, Less than 48H						

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3-3	标准状态如下 (Test conditions shall be as follows) .		
	温度 (Temperature)	20±2℃	
	相对湿度 (Relative Humidity)	65±5%	
	<p>电机在 5~35℃，相对湿度为 45%~85%RH 的环境中测试应能满足 1-5, 1-9, 1-10, 2-1, 2-2 和 2-3 的要求。</p> <p>These condition is applied to requirements in 1-5, 1-9, 1-10, 2-1, 2-2 and 2-3..</p> <p>Actual test conditions of 5℃~35℃, 45%~85% applicable as far as test results are reliable.</p>		
3-4	环境试验 (Environmental test)		
	<p>环境试验后电机应能满足 1-8, 1-10, 2-1, 和 2-5, 2-7 的要求。</p> <p>Motor shall satisfy requirements in 1-8 ~ 1-10, 2-1 and 2-5 ~ 2-7 after environmental test.</p>		
3-4-1	耐湿试验 (Humidity test)		
	<p>电机在温度为 40℃，相对湿度为 90% ~ 95%的环境中置放 48 小时，然后取出在常温下置放 30 分钟。</p> <p>Motor stored in ambient condition of 40℃ 90%~95% relative humidity for 48 hours then retrieved and stored in normal ambient condition for 30 minutes.</p>		
3-4-2	耐高温试验 (High temperature storage test)		
	<p>电机在温度为 80℃，相对湿度为 90%~100%的环境中置放 48 小时，然后取出在常温下置放 30 分钟。</p> <p>Motor stored in ambient condition of 80℃, less than 50% relative humidity for 48 hours then retrieved and stored in normal ambient condition for 30 minutes.</p>		
3-4-3	耐低温试验 (Low temperature storage test)		
	<p>电机在温度为 -20℃，的环境中置放 48 小时，然后取出在常温下置放 30 分钟。</p> <p>Motor stored in ambient condition of -20℃ for 48 hours then retrieved and stored in normal ambient condition for 30 minutes.</p>		
3-4-4	热冲击试验 (Thermal shock test)		
	<p>5 个循环的热冲击试验. 1 个循环包括：在 60℃温度下连续置放 2 小时，然后取出在常温下置放 30 分钟；再在 -10℃ 的温度下置放 2 小时，然后取出在常温下置放 30 分钟 . 电机测试应在电机在常温下置放 30 分钟后进行。</p> <p>5 cycles of thermal shock cycles. 1 cycle consists of successional storage in 60℃ for 2 hours, storage in normal conditions, stored in -10℃ for 2 hours and finally in normal condition again. Measurement shall be made after storage in normal ambient condition for 30 minutes.</p>		
3-4-5	振动试验 (Vibration test)		
	<p>全振幅 2 mm，振动数 1000 c. p. m 的正弦波，在电机 X, Y, Z 三个方向分别进行振动，历时 20 分钟 .</p> <p>Motor shall withstand vibration test when subjected to a vibration of 1000 cpm with 2 mm full wave for 20 minutes in three directions respectively.</p>		

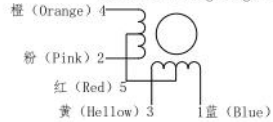
用户 (USER)			
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	<p>3-4-6 冲击或跌落试验 (Shock or Dropping test) 电机在 X, Y, Z 三个方向分别承受 80g 的冲击力各 1 次; 或电机在装箱状态下, 从 75cm 高处, 以 Motor shall withstand without failure when added 80G shock force 1 time, X, Y and Z direction X, Y, Z 三个方向各跌落一次, 电机应正常. respectively, or dropped 1 time in X, Y, and Z direction from height of 75 cm to the concrete floor with motor in packaged condition.</p> <p>(4) 寿命试验 (ENDURANCE TEST) 电机在 12VDC 100 Hz, 200gf.cm 的负荷状态下, 经过 10000 小时 90° 正反方向旋转, 电机应能 Motor shall satisfy requirements in 1-8, 1-9, 1-10 and 2-5 after 10,000 hours of 90° 能满足 1-8, 1-9, 1-10 和 2-5 的要求, 牵入转矩应能满足 1-8 的要求. Back and forth continuous rotation in 200gf.cm load, 12VDC, 100 pps. Pull in torque shall satisfy 1-8.</p> <p>(5) 摩擦机构耐久试验 (FRICTION MECHANISM ENDURANCE TEST) 电机输出轴在经过 1000 次耐久循环试验后, 摩擦力矩在 1800-2400gf.cm, 1 个循环包括 180° 正 Frictional torque of output shaft shall be from 1800gf.cm to 2400gf.cm after 1000 cycles 反两个方向旋转 (1 个循环约 1.5 秒) endurance test. 1 cycles consists of 180° back and forth rotation of output shaft and clutch mechanism must be slipped through this test.</p>		



技术参数

(Electric & Mechanical Properties)

1. 电压 (Voltage) : 12VDC;
2. 相数 (Number of phase) : 4;
3. 减速比 (Gear reduction) : 1/64;
4. 步距角 (Step angle) : 5.625° /64;
5. 驱动方式 (Drive mode) : 四相八拍;
6. 空载牵出频率 (Frequency of light pull out) : $\geq 1000\text{Hz}$;
7. 空载牵入频率 (Max starting frequency) : $\geq 500\text{Hz}$;
8. 牵入转矩 (Pull in torque) : $\geq 600\text{gf}\cdot\text{cm}$;
9. 直流电阻 (Resistance per phase) : $200\Omega \pm 7\%$, 25° C;
10. 自定位转矩 (Detent torque) : $\geq 500\text{gf}\cdot\text{cm}$;
11. 绝缘电阻 (Insulation resistance) : $\geq 10\text{M}\Omega$;
12. 绝缘介电强度 (Dielectric strength) : 600VAC通电1秒钟不被击穿;
13. 绝缘等级 (Insulation class) : E级;
14. 温升 (Temperature rise) : $\leq 40\text{K}$;
15. 噪声 (Noise) : $\leq 40\text{dB}$;
16. 输出轴垂直度 (The output axis perpendicularity) : $90 \pm 1'$;
17. 轴向间隙 (Axial clearance) : 0.05-0.5mm;
18. 摩擦力矩 (Friction torque) : 1800gf.cm-2400gf.cm;
19. 所有未注公差尺寸的极限公差按 (Tolerance unspecified according to) : GB1804-92M级;

接线示意图
Schematic wiring diagram

接线端子号 Connector pin No.	导线颜色 Lead wire color	分配顺序 (No.)							
		1	2	3	4	5	6	7	8
5	红 (Red)	+	+	+	+	+	+	+	+
4	橙 (Orange)	-	-	-	-	-	-	-	-
3	黄 (Yellow)	-	-	-	-	-	-	-	-
2	粉 (Pink)	-	-	-	-	-	-	-	-
1	蓝 (Blue)	-	-	-	-	-	-	-	-

轴伸端视之 → 逆时针方向
Output shaft rotation CCW

				28BYJ48-W03							
								工程部			
标记	数量	更改文件号	签名	年月日	阶段标记		重量	比例		步进电机外形图	
设计					S			1:1		Stepper motor outline drawing	
审核											
工艺								共 1 张 第 1 张			