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SPECIFICATION FOR DC BRUSHLESS MOTOR

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REV	APPROVED			MODEL	10S220H280
	DESIGNED				
APPROVED		D.ZHANG	11/08/04	DRAWING No.	SP198Z0447-000
CHECKED		D.ZHANG	11/08/04		
DESIGNED		P.LI	11/08/01	DC BRUSHLESS MOTOR	Sheet 1 of 8
DRAWN		P.LI	11/08/01		



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1. 应用 Purpose  
本说明书应用于扫码器所使用的主轴马达。  
This document defines the motor for barcode reader systems.

2. 规格 Specification (驱动 IC Drive IC:SANYO LV8800V)

2-1. 标准等级 Ratings

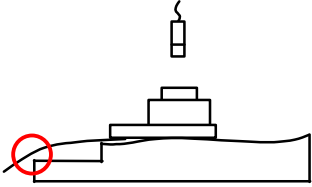
No.	项目 Item	规格 Specification	注记 Notes
1	供给电压 Supply voltage	DC 5[V]	
2	起动电压 Starting voltage	DC 4~6[V]	
3	形式 Type	3 相 12 极外转子无刷式直流马达 3 phases 12 poles outer rotor type DC brushless motor	
4	回转速度 Rated speed	5000[ $\text{min}^{-1}$ ]	
5	回转方向 Direction of rotation	CW	从转子侧进行观测 When viewed from hub side.
6	负荷 Load	偏平衡 : G6.3 MAX 质量 : 5 [g] MAX 惯性力:8.0 [ $\text{g}\cdot\text{cm}^2$ ] MAX	
7	马达姿势 Set position	<div><div>0° +/-10° </div><div>90° +/-10° </div></div>	
8	质量 Mass	15 [g] MAX	马达单体 Motor only

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2-2.特性参数（20 [deg.C]，通常湿度） Electrical parameters (At 20 [deg.C],normal humidity)

No.	Item	Specification	Notes
1	无负荷电流 No Load Current	100 [mA] MAX	E=5V, 无制御。轴垂直状态测定。 E=5V,No control.Shaft perpendicularity,
2	无负荷回转速度 No load speed	5000 [min <sup>-1</sup> ] min.	E=5V, 无制御。轴垂直状态测定。 E=5V,No control.Shaft perpendicularity,
3	线圈电阻 Terminal Resistance	5.7 [Ω] +/-15%	测定 FPC 的三相间电阻 Measure resistance it FPC phase to phase at environmental temperature
4	线圈电感 Inductance	1.0 [mH] MAX (1[kHz])	对 FPC 三相间的电感进行测定。 Measure between Phase and phase.
5	Noise	50 [dB(A)] MAX ---(初始值 Initial value)	E=5V,5000 [rpm ], 无负荷, AXI 4cm。轴 垂直状态。背景噪音最大 20[dB(A)], 0-10[kHz]。 测量时 FPC 与马达固定座之间不能有接 触以及振动。 E=5V,5000 [rpm],No-load, AXI 4cm. Shaft vertical Background noise shall be 20[dB(A)] max. 0-10[kHz] Check no vibration of chattering between FPC and the sponge. 

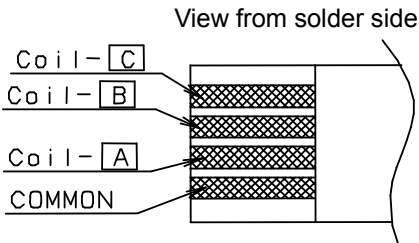
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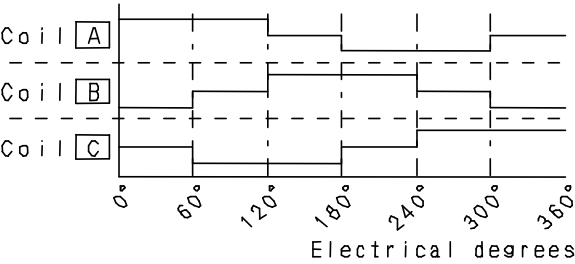
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8	绝缘电阻 Insulation resistance	10 [MΩ] MIN (DC 250[V] )	FPC～底板间测定 Check between FPC and base-plate.
9	绝缘耐压 Hi-pot	1 [s] MIN (AC 300[V], 1[mA])	FPC～底板间测定 Check between FPC and base-plate.

2-3.Electrical interfaces



2-4 Timing chart



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3. 环境条件 Environmental Conditions

3-1. 特性测定条件 Check conditions

特性测定在环境试验后常温，常湿条件下保存 24 小时后进行测定。  
The check conditions should be kept 24 hours min at normal temp and humidity.

3-2.环境以及试验条件 Environment and Test conditions

No.	项目 Item	规格 Specification	试验条件 Test conditions	判定基准 Judgement
1	使用环境 Operating	干燥环境温度: 5 ~ 65 [deg.C] 潮湿环境温度: 30 [deg.C] MAX 相对湿度: 0~85[%] (湿度条件参照 3-3。结成水滴不可) Dry bulb temp.: 5 ~ 65 [deg.C] Wet bulb temp.: 30 [deg.C] MAX Relative humidity: 0~85[%] (Humidity condition is to be refer to 3-3. No condense.)	5000[ $\text{min}^{-1}$ ], 无负荷 No load	*除了噪音以外可以满足项目 2-2 记载的特性要求。 *噪音比初始值变化 10 [dB(A)]以下。 *It should be specified by item 2-2 parameters. (Except noise) *Noise should be 10 [dB(A)] MAX from initial value.
2	保存环境 Non-operating	干燥环境温度: -20 ~ 65 [deg.C] 潮湿环境温度: 30 [deg.C] MAX 相对湿度: 0~90[%] (湿度条件参照 3-3。结成水滴不可) Dry bulb temp.: -20 ~ 65[deg.C] Wet bulb temp.: 30 [deg.C] MAX Relative humidity: 0~90[%] (Humidity condition is to be refer to 3-3. No condense.)	*要防止在包装盒内因振动造成轴承损伤。 *No bearing damage by vibration of burn in box	*除了噪音以外可以满足项目 2-2 记载的特性要求。 *噪音比初始值变化 15 [dB(A)]以下。 *It should be specified by item 2-2 parameters. (Except noise) *Noise should be 15 [dB(A)] MAX from initial value.

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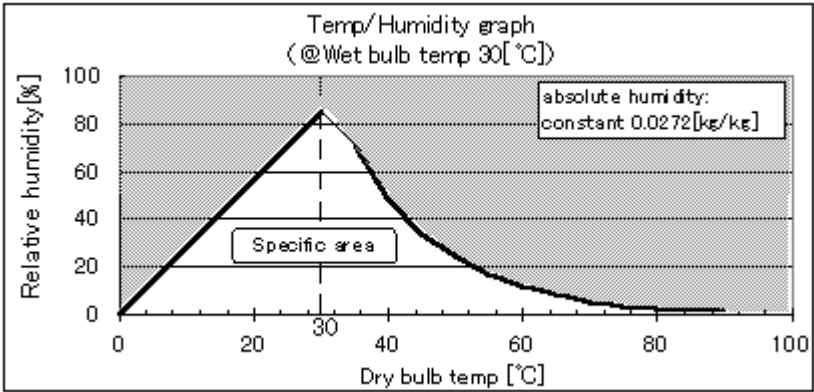
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3	振动 Vibration	20 ~ 500 [Hz], 9.8 [m/s <sup>2</sup> ], sine waves	施加方向: XYZ 施加时间: 每方向 30 分钟 循环时间: 1 [oct/min] Apply Axial : XYZ Apply time: 30[min] per orientation Sweep Speed: 1 [oct/min]	*除了噪音以外可以满足项目 2-2 记载的特性要求。 *噪音比初始值变化 10 [dB(A)]以下。 *It should be specified by Item 2-2 parameters. (Except noise) *Noise should be 10[dB(A)] MAX from initial value.
4	冲击 Shock	490[m/s <sup>2</sup> ], 11[ms] half-sine waves	施加方向: XYZ 次数: 各方向 3 回 Apply Axial : XYZ Number of times: 3 drops per orientation	

3-3.湿度条件 Humidity condition

在高湿的情况下使用时，使用的环境温度就必须的降低。比如100% 湿度下使用时。马达所使用的环境温度就必须保证在30 [deg.C].以下。因此，马达所允许使用的温度与湿度的关系曲线如下图所示。马达所使用的环境条件必须保证在规格范围以内。

The worst environment is under high temperature / humidity, i.e. at 30 [deg.C] and 100% humidity. Wet bulb temperature to be set as under 30 [deg.C].  
Therefore, relative humidity changes by dry bulb temperature as following shows, and environment condition should be within the specific area.



3-4. 禁止烟熏法处理 No fumigation treatment

本产品的轴承，暴露在腐蚀性气体中会引起腐蚀，马达的特性及寿命可能受到影响。因此，在进出口中，对于木质包装材料的烟熏法处理，特别是包装箱有我公司产品，同时进行烟熏法处理的情况，马达的特性不能进行保证。请务必在流通前进行确认。

Exposure of this product's bearing to motor's characteristics cannot be guaranteed if any wooden packing materials are fumigated together with packing boxes containing the product. Please check your transportation before mass corrosive gas may cause corrosion, which may affect the motor's characteristics and durability. Therefore, the production.

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4.寿命 Life

4-1. 特性測定条件 Check conditions

特性測定在环境试验后常温，常湿条件下保存 24 小时后进行测定。  
The check conditions should be kept 24 hours min at normal temp and humidity.

4-2. 环境以及试验条件 Environment and Test conditions

No.	項目 Item	規格 Specification	試験条件 Test conditions	判定基準 Judgement
1	L <sub>1</sub> (Failure rate 1%)	16,000 [h]	回転速度: 5000 [min <sup>-1</sup> ] 额定电压: 5V 无负荷 温度: 65 [deg.C] 通常湿度, 无凝结水滴 Rated speed: 5000 [min <sup>-1</sup> ] Rated voltage: 5V No load Temp.: 5 ~ 65 [deg.C] Humidity: normal condition (No condense)	*无负荷电流变化 30%以下 *马达高度变化 0.2[mm]以下 *When no load current changed 30% MIN from initial value. *When hub height become lower 0.2 [mm] MIN.

5. 包装实验 Packing

No.	項目 Item	規格 Specification	判定基準 Judgement
1	输送实验 Transport test	从弊公司工厂到贵公司生产工厂，捆包开封后，捆包状态没有异常。 The production be transport to your factory from Nidec's company, open the Package state is not changed.	*可以满足项目 2-2 记载的特性要求。 *It should be specified by item 2-2 parameters.

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6. 変更履歴 Change history

Date	Rev.	No.	Before	Design	Approved

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