



# 产品规格书

## PRODUCT SPECIFICATION

|  |  |
|--|--|
| 客户名称Buyer Name                         |  |
| 客户料号Buyer Part No.                     |  |
| 客户承认签章<br>Buyers Approval & Signatures |  |

|                             |                                |               |     |
|-----------------------------|--------------------------------|---------------|-----|
| 文件编号Spec No.                |                                | 版本            | A/2 |
| 品名描述<br>Product Description | 圆柱直流马达<br>Cylindrical DC motor |               |     |
| 型号Part No.                  | VZ4TH5B0191760L                |               |     |
| 送样日期Date                    |                                |               |     |
| 设计Designed by               | 审核Checked by                   | 批准Approved by |     |
|                             |                                |               |     |
| 2022.01.17                  | 2022.01.17                     | 2022.01.17    |     |

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**1. 适用范围/ General Scope**

本说明书适用于圆筒式永磁直流电机VZ4TH5B0191760L型

This specification applies to cylindrical permanent-magnetic motors DC model VZ4TH5B0191760L

**2. 使用条件/ Operating Conditions**

| 项目/Item |                               | 规格/Specifications                             | 条件·备注/Conditions & Remarks                      |
|---------|-------------------------------|---|---|
| 2-1     | 额定电压<br>Rated voltage         | 3.0V DC                                       |   |
| 2-2     | 额定负荷<br>Rated load            | 振子<br>Counterweight                           | 见10. 外形图<br>As specified in 10. Outline Drawing |
| 2-3     | 旋转方向<br>Rotation              | C.W/C.C.W<br>(clockwise or counter clockwise) |   |
| 2-4     | 马达位置<br>Motor position        | 全方位<br>All position                           |   |
| 2-5     | 使用电压范围<br>Operating voltage   | 2.5~3.6V DC                                   |   |
| 2-6     | 使用环境<br>Operating environment | -30 ~ 70℃, 常湿 /<br>Ordinary Humidity:65±20%RH | 无水气凝结<br>No condensation of moisture            |
| 2-7     | 保存环境<br>Storage environment   | -40 ~ 80℃, 常湿 /<br>Ordinary Humidity:65±20%RH | 无水气凝结<br>No condensation of moisture            |

**3. 测定条件/Measuring condition**

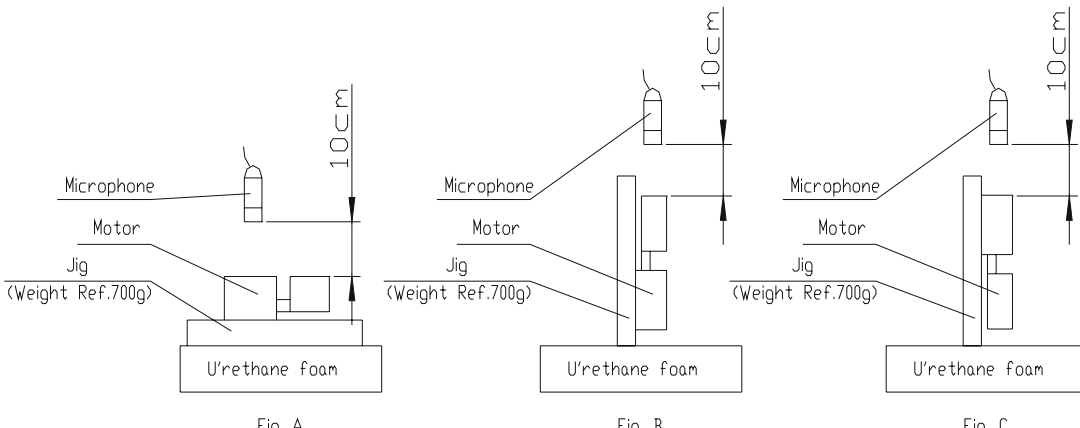
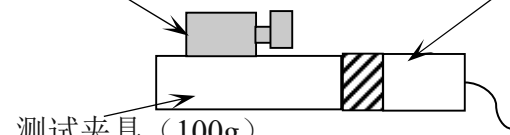
| 项目/Item |                      | 规格/Specifications              | 条件·备注/Conditions & Remarks                     |
|---------|----------------------|--------------------------------|--|
| 3-1     | 温度<br>Temperature    | 20±2℃                          |  |
| 3-2     | 湿度<br>Humidity       | (63%~67%) RH                   |  |
| 3-3     | 位置<br>Motor position | 轴向水平<br>Motor shaft horizontal | 将马达固定在试验台上<br>Lock the motor in a test fixture |

标准测试条件为温度20℃, 湿度 65%。如无疑异, 也可在温度5~35℃、湿度 45~85%的条件下测试。马达测试时, 放置方向为轴向水平。/The measurement at 20℃ & 65%RH is standard. If the judgment is not questionable, recognize measurement at 5℃ to 35℃ & relative humidity 45% to 85%. Direction of motor is shaft horizontal.

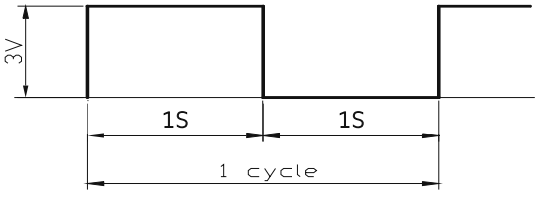
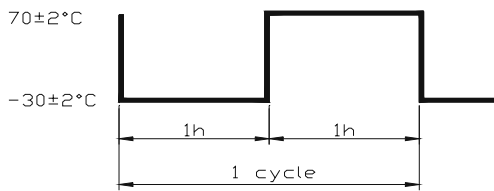
**4. 机械要求/ Mechanical specification**

| 项目/Item |  | 规格/Specifications  | 条件·备注/Conditions & Remarks   |
|---------|--|--|--|
| 4-1     | 结构<br>Configuration                              | 见10. 外形图<br>As specified in 10. Outline Drawing  | Outline drawing No:<br>VZ4TH5B0191760L   |
| 4-2     | 外观<br>Appearance                                 | 不含有机机械损坏及不适当的浸蚀等。<br>There shall be no evidence of<br>mechanical damage and shall not have<br>inadequate corrosion and so on | 目测 (容许范围根据样品外形)<br>Visual examination(allowable extent<br>is based on boundary sample) |
| 4-3     | 轴向间隙<br>Shaft end play                           | 0.1mm~0.3mm  |  |
| 4-4     | 振子固定力<br>Holding strength<br>of vibration weight | 49N (5kgf) Min   |  |

**5.性能特征/Performance and characteristics**

| 项目/Item |                               | 规格/Specifications             | 条件·备注/Conditions & Remarks  |
|---------|-------------------------------|-------------------------------|---|
| 5-1     | 额定转速<br>Rated speed           | 14000 ± 2500rpm               | 在额定电压和额定负载(振子)下。<br>At rated voltage and rated load (vibration weight).   |
| 5-2     | 额定电流<br>Rated current         | 85 mA Max                     |   |
| 5-3     | 堵转电流<br>Stall current         | 140 mA Max                    | 在额定电压下<br>At rated voltage  |
| 5-4     | 起动电压<br>Starting voltage      | 2.3V DC Max                   | 在额定负载(振子)下电枢的任意位置。<br>At rated load (Counterweight) any position of rotor.  |
| 5-5     | 绝缘电阻<br>Insulation resistance | 10M Ω Min                     | 在100V 直流下, 端子和机壳间<br>At DC 100V between Terminal and case.  |
| 5-6     | 端子阻抗<br>Terminal resistance   | 37 Ω (±20%)                   | 在20℃下<br>At 20℃   |
| 5-7     | 机械噪音<br>Mechanical noise      | 50db(A) Max                   | <p>在额定电压、额定负载(振子)下<br/>背景噪音: 不大于28dB.A 计权<br/>测试仪器: B&amp;k<br/>夹具重量: 700g<br/>At rated voltage and rated load (Counterweight).<br/>Back ground noise 28dB(A) Max<br/>Measuring instruments: B&amp;k<br/>Weight of jig: 700g</p>  |
| 5-8     | 振动量<br>Vibration Strength     | Gms 0.8 Min<br><br>Gp 1.1 Min | <p>振动电机<br/>Vibration motor</p> <p>加速度传感器<br/>Accelerometer</p>  <p>测试夹具 (100g)<br/>Test Fixture ( 100g )<br/>额定电压/Rated voltage : DC 3.0V</p>  |

**6. 可靠性/Reliability**

| 项目/Item |                             | 规格/Specification  |   |            |            |            |                   | 判定标准/Judgment   |
|---------|-----------------------------|---|---|------------|------------|------------|-------------------|---|
| 6-1     | 寿命<br>Life time             |    |   |            |            |            |                   | 在常温常湿下放置2h后, 马达应符合项7-1的要求。<br>After 2 hours exposure in ordinary temperature and humidity, Motors shall be approved as specified in item 7-1. |
|         |                             | 位置<br>Position  | 电压<br>Volt  | 负荷<br>Load | 温度<br>Temp | 湿度<br>Humi | 寿命<br>Life        |   |
|         |                             | 轴水平<br>Horizon  | 额定<br>额定  | 重量<br>振子   | 20℃        | 65%        | 200,000<br>Cycles |   |
| 6-2     | 低温放置<br>Low temp exposure   | 温度<br>时间  | /Temperature: $-40\pm 2^{\circ}\text{C}$<br>/Time: 96h  |            |            |            |                   | 在常温常湿下放置2h后, 马达应符合项7-2的要求。<br>After 2 hours exposure in ordinary temperature and humidity, Motors shall be approved as specified in item 7-2. |
| 6-3     | 高温放置<br>High temp. Exposure | 温度<br>时间  | /Temperature: $60\pm 2^{\circ}\text{C}$<br>/Time: 96h   |            |            |            |                   |   |
| 6-4     | 湿度放置<br>Humidity exposure   | 温度<br>湿度<br>放置时间<br>无水气凝结   | /Temperature: $40\pm 2^{\circ}\text{C}$<br>/Humidity: 90~95%RH<br>/Exposure time: 96h<br>No condensation of moisture  |            |            |            |                   |   |
| 6-5     | 振动<br>Vibration             | 频率<br>全振幅<br>加速度<br>周期<br>方向<br>时间  | /Frequency: 10~55~10Hz<br>/Displacement: 1.5mm (p-p)<br>/Acceleration: $22\text{m/s}^2$<br>/Period: 20min 完成10~55~10Hz<br>/20 Minutes log sweep10~55~10Hz<br>/Direction: x, y, z<br>/Time: 每个方向2h /Each 2 hours   |            |            |            |                   |   |
| 6-6     | 自然跌落<br>Free fall           | 试验状态<br>高度<br>方向<br>次数  | /Test state:将马达固定在约75克(包括马达本身)的物体上, 落向水泥地面。<br>Set the motor to the approximately 75g (include the motor) weight of block drop the motor on the concrete floor.<br>/Height: 1.5m<br>/Direction: 6个面 / 6 faces /<br>Number of times: 每个面2次 /<br>Twice 2 each |            |            |            |                   | 测试结果应符合项7-2的要求。<br>After the test motors shall be approved as specified in item 7-2.  |
| 6-7     | 热冲击<br>Heat shock test      | 试验循环  | /Test cycle :20 cycles  |            |            |            |                   | 在常温常湿下放置2h后, 马达应符合项7-2的要求。<br>After 2 hours exposure in ordinary temperature and humidity, Motors shall be approved as specified in item 7-2. |
|         |                             |  |   |            |            |            |                   |   |

**7. 要求/Requirements**

| 项目/Item |               | 判定基准 / Requirements   |
|---------|---------------|---|
| 7-1     | 表A<br>Table A | 1) 额定转速/Rated speed: 不低于初始值-30%,不高于初始值+60%<br>Initial data -30% Min, Initial data +60% Max<br>2) 额定电流/Rated current: 不大于初始值±30%/Initial data±30% max<br>3) 起动电压/Starting voltage: 1.1V DC Max |
| 7-2     | 表B<br>Table B | 1) 额定转速/Rated speed: 不大于初始值±30%/Initial data±30% max<br>2) 额定电流/Rated current: 不大于初始值±30%/Initial data±30% max<br>3) 起动电压/Starting voltage: 1.1V DC Max                                       |

**8. 使用时注意事项/Matters to be paid attention to when using motor**

8-1 电机在运输过程中应小心轻放，避免严重碰撞敲击引起的电机机身和性能受损。(Please lay the motors carefully in transportation to avoid any serious damage to the motor body or its electric function because of collision.)

8-2 请按照规格书中规定的第 2 条(使用条件)来使用和存储电机，否则会影响电机性能。(Please use and storage motors according to N0.2 item (Operating Conditions) in specification, or else motor characteristics would be affected.)

8-3 请在6个月内使用。在使用和打开马达外包装时请避免水气凝结。(Make arrangement to limit the storage period to 6 months or less. Condensation of atmosphere must be avoided in motor usage or opening the packaging of the motor.)

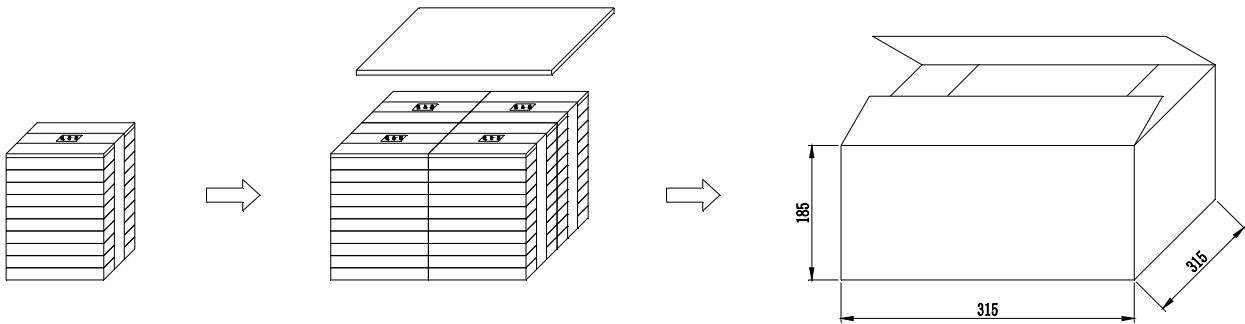
8-4 马达应适当的操作、储存和运转环境中均不可存在腐蚀性气体。例如：H<sub>2</sub>S、SO<sub>2</sub>、NO<sub>2</sub>、CL<sub>2</sub>等。另外存储环境中不可有诸如硅、氰、甲醛水和苯酚等能放射出腐蚀性气体的物质，在电机的机械构造或装置中，如果存在腐蚀性气体，那么这会引起马达不运转。(For proper operation. storage and operating environment must not contain corrosive gases. For example H<sub>2</sub>S. SO<sub>2</sub>. NO<sub>2</sub>. CL<sub>2</sub>. etc. In addition storage environment must not have materials that emit corrosive gases especially from silicon. cyanic. formalin and phenol group. In the mechanism or the set. existence of corrosive gases may cause no rotation in motor.)

8-5 请通电后不要长时间堵住机轴，并且马达转动时不要触碰转子。(Please don't stall the shaft for a long time after powering, and not to touch the weight when motor is rotating.)

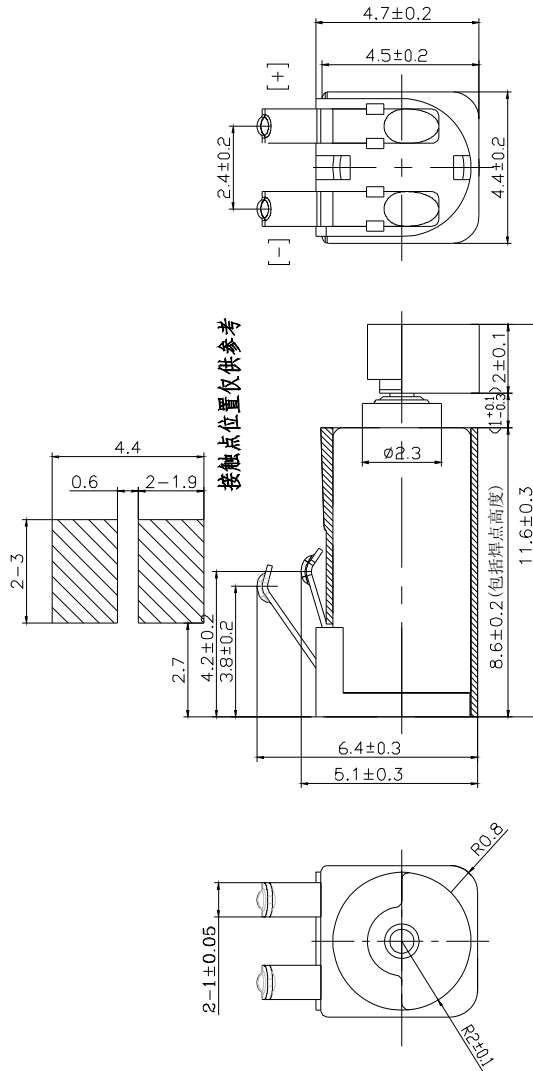
8-6 马达轴向间隙处不应有杂物(如颗粒、纤维物、头发、胶带、胶水等)(There should be no sundries (such as grain, fibre, hair, small tape, glue etc.) in the shaft end play.)

**9. 包装/Packaging**

- (1) 每个吸塑盒里放50个电机。/50 vibrators in each plastic capsule.
- (2) 每25个吸塑盒上盖一个吸塑盒盖，用胶带捆成一捆。/Every 25 capsules as a group put a plastic cover on the group and wrap it in tape.
- (3) 每4捆按图中的叠放方式放入一个外包箱（315×315×185）。/Every 4 bundle are put into an outer case with a size of（315×315×185） by the ways stipulated as the drawing.
- (4) 数量、生产批号均写在外包装箱上。/Quantity and batch number are written on the surface of the outer case.



10. 外形图/Outline Drawing



技术要求/skills requirement

1. 额定电压/Rated voltage: DC 3.0V
2. 额定电流/Rated current: 85mA Max
3. 额定转速/Rated speed: 14500  $\pm$  2500rpm
4. 启动电压/Starting voltage: 2.3V Max
5. 启动电流/Starting current: 100mA Max
6. 端子阻抗/Terminal resistance: 37 (1  $\pm$  20%)  $\Omega$
7. 轴向间隙/Axial clearance: 0.3mm Max
8. 电机总长不包括轴向窜动间隙/The total length of the motor does not include the axial movement gap

