



# 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 Buyers Approval & Signatures	

文件编号Spec No.		版本	A/2
品名描述 Product Description	圆柱直流马达 Cylindrical DC motor		
型号Part No.	VZ4TL2B0020011		
送样日期Date			
设计Designed by	审核Checked by	批准Approved by	
2022.03.17	2022.03.17	2022.03.17	

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**1. General scope**
**1-1 The specifications apply to the coreless cylindrical permanent magnetic micro vibration motor**
**DC model VZ4TL2B0020011.**
**2. Operating conditions**

Items		Specifications	Condition & Remarks
2-1	Rated voltage	3.0V DC	
2-2	Rated load	Counter weight	As specified in the outline drawing.
2-3	<b>Rated speed</b>	12,000 ± 2,000 rpm	
2-4	Rotation	C.W. (clockwise)	
2-5	Motor position	All positions	
2-6	Operating voltage	2.0~4.0V DC	
2-7	Operating conditions	-20 ~ 70°C, ordinary humidity	No condensation of moisture.
2-8	Storage conditions	-30 ~ 80°C, ordinary humidity	No condensation of moisture.

**3. Measuring conditions**

Items		Specifications	Condition & Remarks
3-1	Temperature	20±2°C	
3-2	Humidity	(63% ~ 67%) RH	
3-3	Motor position	Shaft horizontal	Lock the motor in a test fixture.

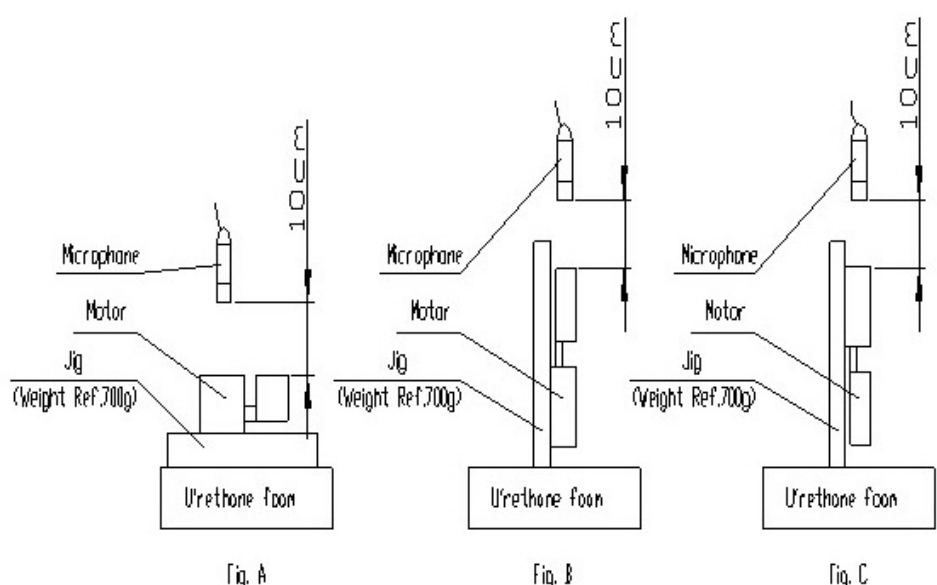
**3-4 All data are based on the measuring conditions: Temperature, 20°C; Humidity, 65% RH. If any disagreement occurs, such test conditions are available: Temperature, 5~35°C; Humidity, 45 ~ 85% RH.**
**4. Mechanical specifications**

Items		Specifications	Condition & Remarks
4-1	Configuration	As specified in outline drawing	Outline drawing No: <b>VZ4TL2B0020011.</b>
4-2	Appearance	There shall be no evidence of mechanical damage and shall not have inadequate corrosion, etc.	Visual examination: Inspection carried out on samples.
4-3	Shaft end play	0.05 mm ~ 0.2 mm Max	
4-4	Weight of motor	0.87g approx.	
4-5	Holding strength of vibration weight	49N (5kgf)	

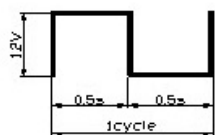
**5. Performance and characteristics**

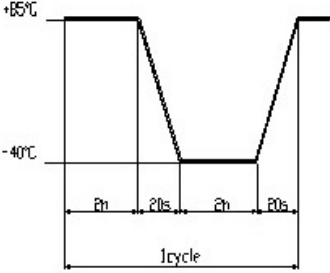
Items	Specifications	Condition & Remarks
5-1	Rated speed	12,000 ± 2,000 rpm
5-2	Rated current	130mA max
5-3	Stall current	145mA max
5-4	Starting voltage	2.0V DC max
5-5	Insulation resistance	1MΩ min
5-6	Terminal resistance	23Ω approx.
5-7	Mechanical noise	50db (A) max

Measured at rated voltage and rated load (vibration weight).  
 Background noise: 28db (A) max. @ 10cm.  
 Measuring instruments: B & K.  
 The weight of jig: 700g.



**6. Reliability Test**

Items		Standard test conditions			Condition & Remarks	
6-1	Life test					After 2 hours exposure in ordinary Motors shall be approved as specified in item 7-1.
		Position	Horizontal	Horizontal		
		Voltage	Rated	Rated		
		Load	Vibe weight	Vibe weight		
		Temperature	20°C	40°C		
		Humidity	65%	90%		
		Life (cycles)	200,000	400,000		
6-2	Low temperature exposure test	Temperature: -40±2°C Time: 24hrs			After the test motors shall be approved as specified in item 7-2.	
6-3	High temperature exposure test	Temperature: 85±2°C Time: 300hrs				
6-4	High humidity exposure test	Temperature: 60±2°C Humidity: 90~95% RH Exposure time: 240hrs Dry time: 4 hrs No condensation of moisture				
6-5	Vibration test	Displacement: 1.5 mm (p-p) Frequency: 10 to 55 Hz Period: 20 Minutes log sweep (10~55~10 Hz) Direction: x, y, z Time: Each 2 hours			After the test motors shall be approved as specified in item 7-2.	
6-6	Drop test	Test state: Set the motor to the approximately 100g (include the motor) weight of block drop the motor on the concrete floor. Height: 1.5 meters Direction: ±x, ±y, ±z Number of times: Each 2 times			After the test motors shall be approved as specified in item 7-2.	

6-7	Heat stock test	 <p>Period: 32 cycles</p> <p>Exposed at ordinary temperature and ordinary humidity for 24 hours before measurement.</p>	After the test motors shall be approved as specified in item 7-2.
6-8	Sulfur gas	Temperature: 100°C Time: 48hrs Environment: Sulfur gas	No corrosion on the brush and the commutator.
6-9	Salt spray test	Temperature: 35°C Time: 48hrs Environment: 5% salt spray	No any sign of corrosion.
6-10	Las Vegas test	Temperature: 60°C Time: 48hrs Humidity: <20% RH Test mode: 8 secs on (C.W.) 52 secs off	After the test motors shall be approved as specified in item 7-2.

**7. Requirements**

Items		Requirements	
7-1	Table A	1) Rated speed: 2) Rated current: 3) Insulation resistance: 4) Starting voltage: 5) Current waveform:	Initial data -30% min./ +60% max. Initial data ±30% max 1 MΩ min 2.0V DC max Normal
7-2	Table B	1) Rated speed: 2) Rated current: 3) Starting voltage:	Initial data -30% min./ +60% max. Initial data ±30% max 2.0 V DC max

**8. Caution and Matters**

8-1 Warnings: In a motor near the end its life, or under breakdown conditions, short circuits can develop between commutator segments. Uncontrolled voltage may then leak into the power source circuit. Motors may overheat or fail if run continuously with its rotor locked condition or under excessive loads.

8-2 Destructive atmospheres: Do not use and store the motor in the corrosive gas atmosphere (H<sub>2</sub>S, SO<sub>2</sub>, NO<sub>2</sub>, Cl<sub>2</sub>, etc.), or substances that can emit toxic gases, such as organic silicon, cyanide, formalin, or phenol compounds. The motor may get serious damages.

8-3 Condensation: Condensation on the electrical circuits can destroy the motor or control circuits. Monitor the environment and undertake measures to prevent condensation, such as installing condensation sensors to cut power when necessary.

8-4 Be aware of the following factors and perform necessary tests to check a motor's ability to adopt with your mechanism and applications: Motor life, electric noise, mechanical noise, vibration, static-electrical noise resistance, power-source noise resistance, drift of rpm, electrical resonance between control circuit and motor, mechanical resonance between subassembly and motor malfunction due to motor noise, electrical magnetic interference, malfunction due to magnetic flux leakage, destruction due to lightning-related power surge, grounding.

8-5 Some particular plastic materials can crack and fail after exposure to motor bearing oil. Perform test the motor in/on the subassembly to check the influence of the oiled plastic parts.

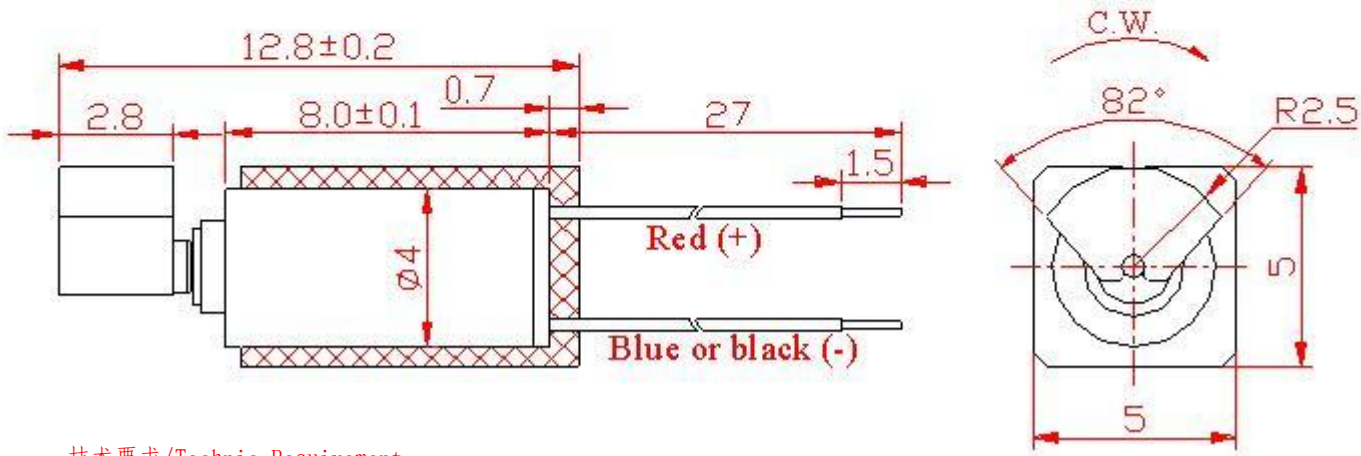
8-6 Avoid connecting a serial resistor to the motor if at all possible, as this can negatively affect reliability. If this is unavoidable, keep resistance as low as possible and test thoroughly for reliability before using.

8-7 When testing for UL, CSA or other safely standards, apply for approval for the entire subassembly.

8-8 Do not store motors under conditions of extreme temperatures or high humidity, or for longer than six months even room conditions. When removing out of packaging after storage, take precautions to prevent condensation.

8-9 Connections: Complete soldering operations within three seconds to prevent damage to leads and terminals. Make sure that the soldering tip does not exceed 350°C. Be gentle with terminals; dents or pressure on them can lock up the motor.

8-10 Please consults us in advance when design considerations call for forcefully stalling the motor using a short circuit at the terminal or reverse voltage. Such operations can shorten product life.

**9. 外形图/Outline Drawing**

**技术要求/Technic Requirement**

1. 额定电压/Rated voltage: 3.0V
2. 额定电流/Rated current: 130mA Max
3. 额定转速/Rated speed:  $12000 \pm 2000$ rpm
4. 堵转电流/Stall current: 145mA Max
5. 端子阻抗/Terminal resistance:  $23\Omega (\pm 20\%)$
6. 起动电压/Starting voltage: 2.0V Max
7. 轴向间隙/Shaft end play: 0.05~0.2mm
8. 导线规格/Lead spec: AWG32 UL3302
9. 所有尺寸为A向压紧后的尺寸(不包括轴向间隙)  
/Overall length is measured after counterweight being pressed against body in direction A. (Shaft end play is not included.)
10. 未注线性公差为/Unmarked tolerance:  $\pm 0.1$ mm

**10. 修改记录/Revision History**

修改号 Rev. No.	日期 Rev. Date	页码 Page No.	修改项目 Revised Item	更改原因 Reason
A/0	2013.08.23	/	产品颁布/ Release for Production	
A/1	2020.07.01	/	changed company name from JINLONG MACHINERY to VYBRONICS, changed part # from Z4TL2B0020011 to VZ4TL2B0020011	Rebranding
A/2	2022.03.17	/	Changed wire spec from UL1571 to UL3302	