

1. Operating scope 适用范围

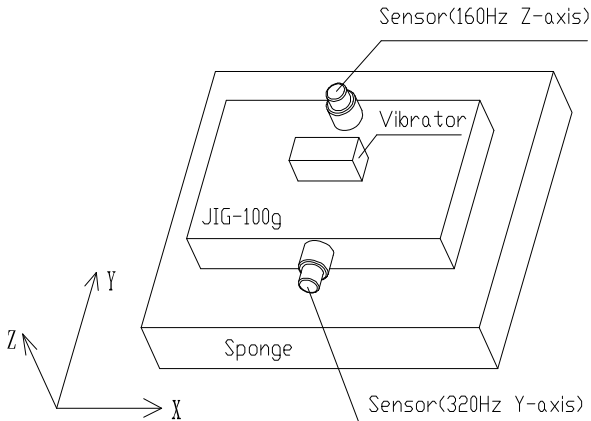
This specifications apply to linear vibrator model L91022-160-320H.

本规格书适用于 VL91022-160-320H 线性振动器。

2. Storage, operating, conditions 储存, 使用条件

| No | Items (项目) | Conditions (条件) |
|-----|---------------------------------------|---------------------------------------|
| 2-1 | Operating temperature range 使用温度范围 | -20 Celsius ~ +60Celsius -20°C~+60°C |
| 2-2 | Storage temperature range 储存温度范围 | -30 Celsius ~ +70 Celsius -30°C~+70°C |
| 2-3 | Operating humidity range 使用湿度范围 | Humidity:10~90%RH 湿度: 10~90%RH。 |
| 2-4 | Storage humidity range 储存湿度范围 | Humidity: 5~95%RH 湿度: 5~95%RH |

3. Measuring conditions 测量条件

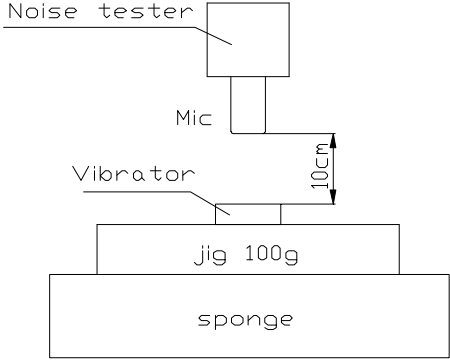
| No | Items (项目) | Conditions (条件) |
|-----|-------------------------------|--|
| 3-1 | Ambient temperature 环境温度 | 20±5°C |
| 3-2 | Ambient humidity 环境湿度 | 65 RH±20% |
| 3-3 | Rated voltage 额定电压 | DC3.0V square wave, Duty cycle 50%, 160Hz or 320Hz |
| | | AC1.5Vrms sine wave, 160Hz or 320Hz |
| 3-4 | Input voltage Range 输入电压范围 | DC 0~3.3V square wave, Duty cycle 50% |
| | | AC 0~1.65Vrms sine wave |
| 3-5 | Measurement reference 测量参考 | <p>Refer to the figure below to fix the vibrator and acceleration sensor, and then input the rated voltage for measurement 参照下图所示固定振动器和加速度传感器, 然后输入额定电压进行测量</p>  |

4. Appearance requirements 外观要求

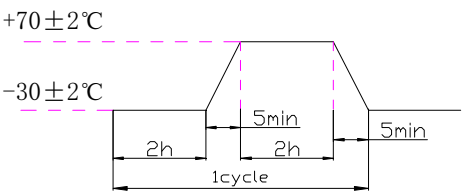
| NO | Items(项目) | Requirements (要求) | Remarks (备注) |
|-----|--------------------------------|---|--------------------------------|
| 4-1 | Shape structure size 外形结构尺寸 | According to the outline drawing 依照外形图 | Refer to outline drawing 参见外形图 |
| 4-2 | Appearance 外观 | No distortion 、 rust 、 stain, etc. 无变形、锈蚀、污迹等 | Visual examination 目视检查 |

5. Specifications 技术参数

| NO | Items(项目) | Specifications(参数) | Remarks (备注) |
|-----|-----------------------------|--|--|
| 5-1 | Operating voltage 使用电压范围 | DC 1~3.3V | Square wave |
| | | AC 0.5~1.65Vrms | Sine wave |
| 5-2 | Rated Current 额定电流 | 180mA (Max) | At rated voltage 在额定电压下 |
| 5-3 | Vibration direction 振动方向 | 160Hz Z axis direction 160Hz Z 轴方向 320Hz Y axis direction 320Hz Y 轴方向 |  |
| 5-4 | Acceleration 加速度 | 160Hz 3±1.2G | Refer to 3-5, (Recommended accelerometer VM83) 参照 3-5(推荐加速度计 VM83) |
| | | 320Hz 2.8±1.5G | |
| 5-5 | Rise time 启动时间 | <50ms | The time reaching to 50% of normal acceleration from power on 通电达到正常加速度的 50%的时间 |
| 5-6 | Break time 断开时间 | <120ms |  |
| | | | The time reaching to 30% of normal acceleration from power off 从断电到正常加速度的 30%的时间 |
| 5-7 | Insulation resistance 绝缘电阻 | 5MΩ (Min) | 100V DC, Between the vibrator terminal and case. 测试电压 DC100V, 端子和机壳间。 |
| 5-8 | Weight 重量 | 7.5±1g | Use scale/用天平测量 |

| | | | |
|------|-----------------------------|----------------------|---|
| 5-9 | Terminal resistance 端子电阻 | $8\ \Omega \pm 20\%$ | AT 20°C |
| 5-10 | Mechanical noise 机械噪音 | 55dB-A (Max) | At rated voltage and rated load; background noise 30dB-A (Max) 在额定电压和额定负载下, 背景噪音不超过 30dB-A.  <p>The diagram illustrates the test setup for mechanical noise measurement. It shows a 'Noise tester' box connected to a 'Mic' (microphone). The microphone is positioned 10cm above a 'Vibrator' box. The vibrator is supported by a 'jig 100g' (100g jig) which is placed on a 'sponge' (sponge) base.</p> |

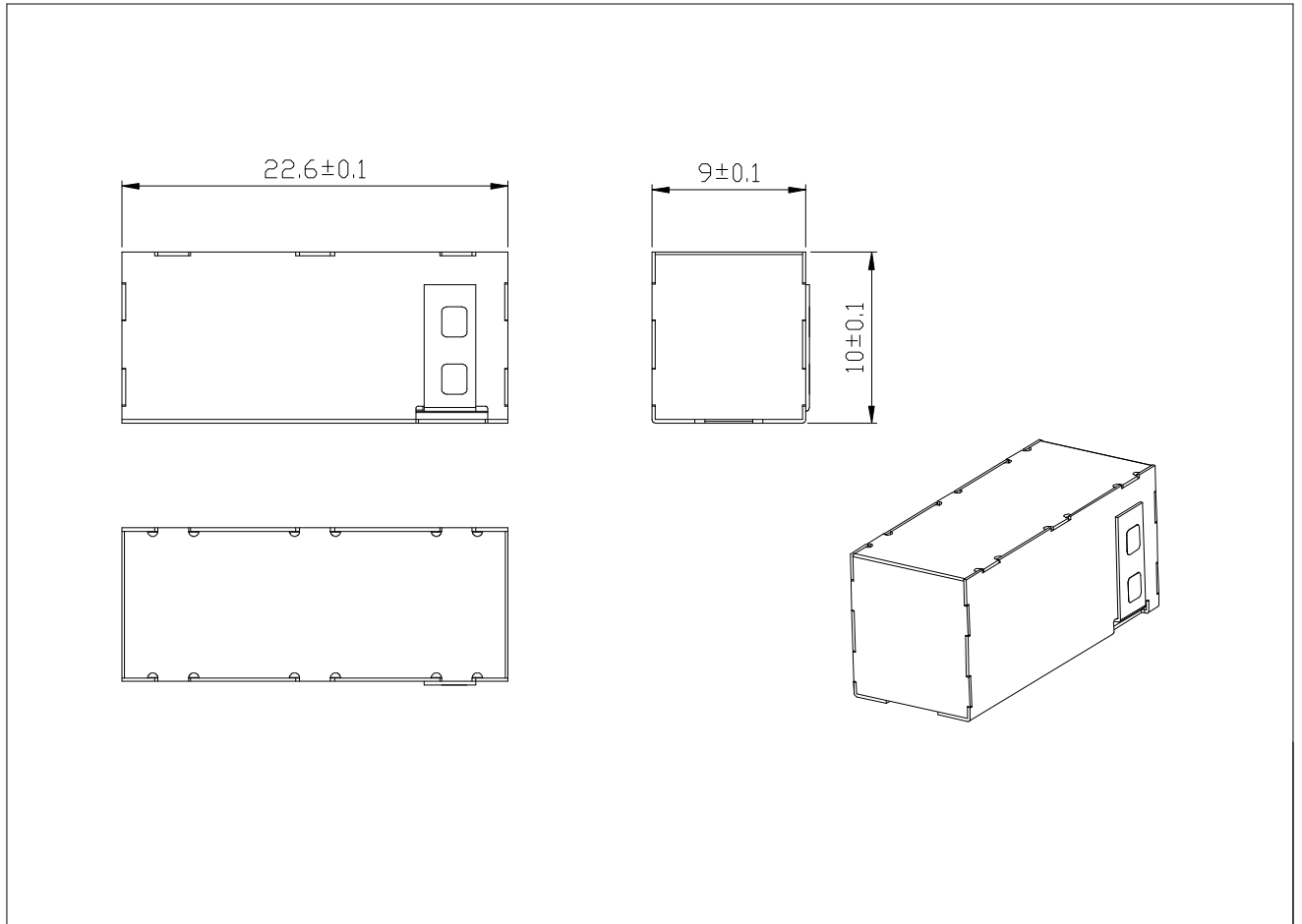
6. Reliability test 可靠性试验

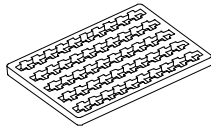
| NO | Items (项目) | Standard test conditions (标准试验条件) | Judgment (判定) |
|-----|--|--|--|
| 6-1 | Life test 寿命试验 | Temperature 温度: $20 \pm 5^{\circ}\text{C}$ Humidity 湿度: $65\text{RH} \pm 20\%$ Test voltage 试验电压: Rated voltage 额定电压 Test model 试验形式: 1S on 1S off (one cycle) Test cycle 试验周期: 160Hz 302400 cycles (168h) 320Hz 302400 cycles (168h) | After the test, After 2 hours placed in ordinary temperature and humidity, vibrator shall be satisfy with specified in item 6-8 试验结束后, 在常温常湿下放置 2 小时后, 振动器应满足 6-8 项中的规定 |
| 6-2 | Low temp Storage 低温存放试验 | Temperature 温度: $-40 \pm 2^{\circ}\text{C}$ Test time 试验时间: 120 hours | |
| 6-3 | High temp storage 高温存放试验 | Temperature 温度: $80 \pm 2^{\circ}\text{C}$ Test time 试验时间: 120 hours | |
| 6-4 | Humidity storage 湿度存放试验 | Temperature 温度: $50 \pm 2^{\circ}\text{C}$ Humidity 湿度: $90 \sim 95\% \text{RH}$ Test time 试验时间: 120 hours | |
| 6-5 | Temperature shock 温度冲击 | $+70 \pm 2^{\circ}\text{C}$ $-30 \pm 2^{\circ}\text{C}$  Test duration 试验持续时间: 6cycles | |
| 6-6 | Packing vibration test 包装振动试验 | Total peak amplitude 全振幅: 1.5mm (P-P) Frequency 频率: 60Hz Period 周期: 10-55-10Hz Direction 方向: X, Y, Z Test time 试验时间: 30 minutes at each stage 每个阶段 30 分钟 | |
| 6-7 | Parking Drop test 包装跌落试验 | outside box is dropped from 1 corner , 3 edge and 6 surface each 1 time from the height of 0.6m, to the concrete floor 外箱从 1 角、3 棱、6 面各 1 次从 0.6 米高度落至混凝土地面 | |
| 6-8 | 1、Acceleration 加速度: Initial Value $\pm 50\%$ 2、Rated Current 额定电流: Max. 180mArms 3、Noise T 噪音: Max. 55dB 4、There should be no abnormalities in appearance and structure. 外观和结构应无异常。 | | |

7. Caution for Use 使用注意事项

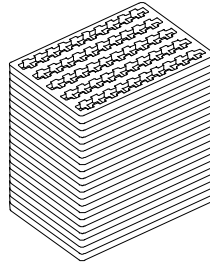
- 1) Please use vibrator in the specification of this specification. Otherwise the service life and performance of the vibrator will be affected.
请在本规格书规范内使用振动器，否则会影响振动器的使用寿命和性能。
- 2) Vibrators can't be used in high temperature, High humidity and corrosive gas environment.
振动器不能在高温、高湿度和有腐蚀性气体环境中使用。
- 3) The vibrator shall be firmly fixed in the direction of vibration, Otherwise it will be prone to noise.
振动器应牢牢固定在振动方向上，否则容易产生噪声。
- 4) The vibrator has a strong magnet, So please be aware that it has a magnetic force on the surface of the bracket.
振动器有一个强的磁铁，因此请注意，它的机壳表面有磁力。
- 5) Do not press the product with more than 15N , It can cause the transformation of performance or external appearance.
不要用超过 15N 的力按压振动器，那样会导致性能或外观的变化。
- 6) Please use the vibrator within 6 months, If it exceeds the storage period, you need to re-check and confirm it.
请在 6 个月内使用振动器，如果超过存储周期，则需要重新检查和确认。
- 7) Under the conditions of meeting this specification, our company can change the material、size and shape of parts to improve quality、 performance or production efficiency.
在满足本规范的情况下，我司可以改变零件材料、尺寸及形状来改善品质、性能或生产效率。
- 8) If there is any argument on vibrator performance and/or life, judgment is to be made base on this specification only.
如对振动器的性能和（或）寿命有任何争议，仅基于此规格书作出判断。

8. Outline drawing 外形图

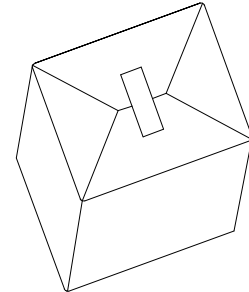


9. Packaging requirements 包装要求

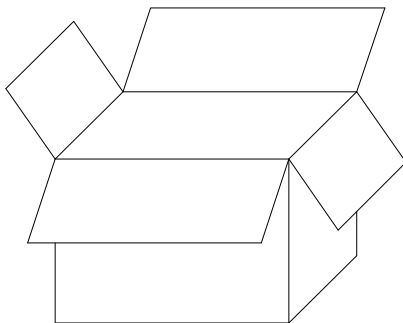
Each tray is equipped
with 50 vibrators
每托盘装50只振动器



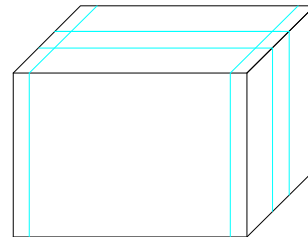
1000 vibrators per heap
每堆1000只振动器



Use plastic bags to
prevent humid
用塑料袋包装防潮



Each packing box is equipped
with 2000 vibrators
每个包装外箱装2000只振动器



Seal the outer box with adhesive
tape and tie it firmly with
packing strap
用胶带密封外箱，并用打包带捆扎牢固。