

**RoboteQ Inc**  
**Compliance to specification IEC 60204-1 of RoboteQ controllers**  
**Applicable paragraphs**  
**V161031**

- **4.3.3 DC Supplies**

- Voltage**

- 0.7 to 1.2 of battery nominal voltage.**

- Specification met by design. Controllers are designed to operate at a large battery voltage, 12 to 30 Volt and 12 to 60 Volt. The voltage range is sufficient to allow the system designer to choose a nominal battery voltage within spec.

- Tested in house at model qualification.

- Interruption not exceeding 5 msec**

- Guaranteed by design by redundancy. All controllers have an auxiliary low current battery input which allows the controller to survive temporary brown-outs or black-outs without resetting or losing control.

- **4.4.2 EMC**

- The specification applies to the whole system. The component being a component it is exempt.

- **4.4.3 Ambient Air Temperature**

- Ambient +5 to +40 oC**

- Specification met by design (all components are specified -40 +85 oC); tested internally at model qualification testing done internally at -40 oC. See also life test below.

- **4.4.4 Humidity**

- up to 50%**

- See life test below

- Condensation**

- Condensation guaranteed by conformal coating available on customer request.

- *Life Test: Roboteq routinely performs year-round life test on its controllers at high amperage.. Life test duration is 40 hours and ambient conditions vary seasonally from 20 to 45 OC and humidity 15 to 75 %.*

- **4.4.6 Contaminants**

- Specification met by design; enclosed controllers designed to IP51 NEMA.

- **4.4.8 Vibration Shock, Bump**

- Not applicable. See more specific IEC 61800-5 paragraph 5.2.6.4

- **4.5 Transportation and Storage**

- Guaranteed by 4.4.3

- **6.2.2 Protection by Enclosure**

- Guaranteed in all controllers that use enclosure except for SBL1360.

- **6.2.4 Residual Voltages**

All controllers fully discharge in less than five seconds; tested internally at model qualification test..

- **6.4.1 Protection by PELV**

Applicable to all controllers designed for use 60 Volt or below.

72 Volt controllers covered by EU LOW VOLTAGE Directive 2006/95/EC.

- **7.2.9 Overcurrent Protection**

By design. All controllers are equipped with a current limiting mechanism.

Tested internally at model qualification test.

- **7.3.2 Overload Protection**

By design. All controllers have a Stall or Motor Lead Short protection.

Tested internally at model qualification test.

- **7.3.3 Over-temperature protection**

By design. All controllers have over-temperature protection.

Tested internally at model qualification test

- **9.2.5.4.2 Emergency Stop**

By design. All controllers have Emergency Stop function.

Tested internally at model qualification test

## **Compliance to specification IEC 61800-5 of RoboteQ controllers**

### **Applicable paragraphs**

- **4.3.11 Capacitor Discharge**  
Calculated and tested at model internal qualification test.  
See 5.2.3.7
- **4.4.1 Flammability**  
All flammable materials are purchased flammability class V-1 or better.  
PCB's  
Power cables are specified 105 oC, UL and CSA certified.  
Plastic enclosures.
- **5.2.3.8 Temperature rise test**  
Tested on sample basis by Operative Life Test at maximum rated current.
- **5.2.6.4 Vibration test**  
Tested at model qualification by an external Laboratory.
- **6 Information for Installation**  
Ensured by Datasheet and User Manual for the applicable sub-paragraphs.

## **Compliance to specification IEC2004-108/EC RoboteQ controllers**

### **Applicable paragraphs**

- **Section Introduction paragraph 20**  
Exemption for components sold to be incorporated in systems, otherwise not usable as stand alone.  
A controller cannot be useful if utilized stand alone, even if connected to a power supply.
- **Article 9 paragraph 20**  
Controllers are marked as required, and relevant information are provided by label on controller and technical literature inclusive of recommendation on how to implement a system conforming to Annex 1 point 1