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.
  
  **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