



**APPLICATION FOR TEST REPORT**  
**UL 2849**  
**On Behalf of**

Prepared For: Foshan Jinrong Electric Vehicle Industry Co., Ltd

Address: No.2, Floor 3, Building 1, Plot 27-1-1, Fu'an Industrial Zone, Yuyuan Village, Leliu Subdistrict, Shunde District, Foshan City, Guangdong Province China

Product Name: Electric Bike

Model: S600

Trade Mark: Shengmilo

Manufacturer: Foshan Jinrong Electric Vehicle Industry Co., Ltd

Address: No.2, Floor 3, Building 1, Plot 27-1-1, Fu'an Industrial Zone, Yuyuan Village, Leliu Subdistrict, Shunde District, Foshan City, Guangdong Province China

Prepared By: Shenzhen Wuxiang Testing (Group) Co., Ltd.  
Building B, Xinbaosheng, No.233, Xixiang Street, Bao'an District, Shenzhen, China

Test Date: January 15, 2024 to January 19, 2024

Date of Report: January 19, 2024

Report No.: WUX202401150207UL





## UL 2849 TEST REPORT

|                                                  |                                                                                                                                    |                              |                                                                                              |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------------------------------------------|
| Standard: <u>ANSI/CAN/UL 2849-2022A</u>          |                                                                                                                                    |                              |                                                                                              |
| Report No.:                                      | WUX202401150207UL                                                                                                                  | Client:                      | Foshan Jinrong Electric Vehicle Industry Co., Ltd(Shanghai) Intelligent Technology Co., Ltd. |
| Product:                                         | Electric Bike                                                                                                                      | Rated data:                  | Adaptor: Input:100-240V~, 50/60Hz, 2.5A(MAX)<br>Output: 54.6V ---2.0A                        |
| Project Engineer:                                | Tony Bi                                                                                                                            |                              |                                                                                              |
| Test Engineer:                                   | Lucy Lu                                                                                                                            | Protection class             | --                                                                                           |
| Application Date                                 | January 15, 2024                                                                                                                   | Protection against moisture: | Min. IP44                                                                                    |
| Requested Date                                   | January 19, 2024                                                                                                                   | Construction:                | With battery                                                                                 |
| Re-test                                          | <input type="checkbox"/>                                                                                                           | Operation mode               | Continuous                                                                                   |
| Full-test                                        | <input checked="" type="checkbox"/>                                                                                                | Weight:                      | > 10kg                                                                                       |
| Tested Model :                                   | S600                                                                                                                               | Sample No.                   | 1#                                                                                           |
| Should the heating test be done in heating oven? | <input type="checkbox"/> Yes    °C<br><input checked="" type="checkbox"/> No                                                       |                              |                                                                                              |
| Altitude during operation (m)                    | <input type="checkbox"/> Up to 2000<br><input checked="" type="checkbox"/> No                                                      |                              |                                                                                              |
| Altitude of test laboratory (m)                  | <input checked="" type="checkbox"/> below 2000<br><input type="checkbox"/> No                                                      |                              |                                                                                              |
| Other information:.....                          | Outdoor used, Battery, With over charge protection, Over discharge protection, over current protection and temperature protection. |                              |                                                                                              |

## Lab Use Only

Lab Start Date

January 15, 2024

Lab Finish Date

January 19, 2024

Ambient Temperature, °C

24.3

Relative Humidity, %

49.5

Remarks:

Tested by(Engineer: Lucy Lu): Lucy LuChecked by(Manager: Tony Bi): Tony Bi

**\*\*Modified History\*\***

| Revision     | Description                 | Issued Data | Remark  |
|--------------|-----------------------------|-------------|---------|
| Revision 1.0 | Initial Test Report Release | 2024/01/19  | Lucy Lu |



| No.1 | Clause(s) | Test(s)                                                              | Remark                                                                   | Comment |
|------|-----------|----------------------------------------------------------------------|--------------------------------------------------------------------------|---------|
|      | 7         | General                                                              | Maximum altitude of 2000 m<br>ambient temperature range of 0° C to 40° C | Pass    |
|      | 8         | Power Levels                                                         | DC56V<br><240VA                                                          | Pass    |
|      | 9         | Combination of Battery, Battery Management System, and Charger       | UL 2580<br>UL 1310                                                       | Pass    |
|      | 10        | User Protection While Charging                                       | UL 2097                                                                  | Pass    |
|      | 11        | Battery Packs                                                        | UL 2580                                                                  | Pass    |
|      | 12        | Safety Circuits and Safety Analysis                                  | UL 60730-1                                                               | Pass    |
|      | 13        | Enclosing and Insulating Hazardous Parts                             | UL 746C<br>RTI>80℃<br>V-1, UL94<br>NO Sharp Edges                        | Pass    |
|      | 14        | Mounting                                                             | Vibration Test                                                           | Pass    |
|      | 15        | Printed Wiring Boards                                                | UL 796                                                                   | Pass    |
|      | 16        | Spacings and Separation of Circuits                                  | UL 1310 for adaptor                                                      | Pass    |
|      | 17        | Flammability                                                         | V-0, UL94<br>Passed by UL 1310 for adaptor                               | Pass    |
|      | 18        | Internal Wiring and Terminals                                        | Cannot touch live part                                                   | Pass    |
|      | 19        | Overcurrent Protection                                               | UL 248-1                                                                 | Pass    |
|      | 20        | Motors and Motor Controllers                                         | UL 1004-1                                                                | Pass    |
|      | 21        | Operator Interface and Communication Devices                         | UL 62368-1                                                               | Pass    |
|      | 22        | Grounding and Bonding                                                |                                                                          | N/A     |
|      | 23        | Chargers                                                             | UL 1310                                                                  | Pass    |
|      | 24        | Electrical Cables and Connectors Between the eBike and the Equipment |                                                                          | Pass    |
|      | 25        | Supply Connections                                                   | UL 1310                                                                  | Pass    |



|  |       |                              |               |      |
|--|-------|------------------------------|---------------|------|
|  | 27    | Input Test                   | See the table | Pass |
|  | 28    | Temperature Test             | See the table | Pass |
|  | 29    | Isolation Resistance Test    | See the table | Pass |
|  | 30    | Dielectric Strength Test     | See the table | Pass |
|  | 31    | Humidity Conditioning        | See the table | Pass |
|  | 32    | Abnormal Operations Tests    | See the table | Pass |
|  | 33    | Impact Test                  | See the table | Pass |
|  | 34    | Mold Stress                  | See the table | Pass |
|  | 35    | Flexing Test                 |               | N/A  |
|  | 36    | Ingress Protection Tests     | See the table | Pass |
|  | 37    | Permanence of Marking        | See the table | N/A  |
|  | 38    | Vibration Test               | See the table | Pass |
|  | 39    | Strain Relief                | See the table | Pass |
|  | 40    | Startup Assistance Mode Test |               | Pass |
|  | 41    | Motor Assistance Control     |               | Pass |
|  | 42-44 | MARKINGS                     |               | Pass |
|  | 45-50 | MARKINGS                     |               | Pass |

**Spacings (16)**

|                                                               |                     |              |                  |         |                  |         |      |
|---------------------------------------------------------------|---------------------|--------------|------------------|---------|------------------|---------|------|
| 16                                                            | Electrical Spacings |              |                  |         |                  |         | Pass |
| Clearance (cl) and creepage distance (cr) at/of/between:      | U peak (V)          | U r.m.s. (V) | Required cl (mm) | cl (mm) | Required cr (mm) | cr (mm) |      |
| opposite polarity of battery                                  | --                  | 54.6         | 1.7              | >2.5    | 1.7              | >2.5    |      |
| Input to Enclosure                                            | --                  | --           | --               | --      | --               | --      |      |
| Primary component to accessible enclosure (RI)                | --                  | --           | --               | --      | --               | --      |      |
| Primary trace to secondary trace under transformer (T1) (RI)  | --                  | --           | --               | --      | --               | --      |      |
| Primary winding to secondary winding of transformer (T1) (RI) | --                  | --           | --               | --      | --               | --      |      |
| Supplementary information                                     |                     |              |                  |         |                  |         |      |
| Note(s): --                                                   |                     |              |                  |         |                  |         |      |

**Protection of Users – Accessibility of Terminals (18)**

|          |                      |                  |                                                   |      |      |      |
|----------|----------------------|------------------|---------------------------------------------------|------|------|------|
| 18       | Accessibility probe  |                  |                                                   |      |      | Pass |
| Location | Dimension of opening | Tester           | Observations                                      | Pass | Fail |      |
| Opening  | No opening           | Articulate probe | Can't touch Live parts and dangerous moving parts | √    | --   |      |



## INPUT TEST (27)

### Method:

EUT is operating at:  $U=U_n$ ,  $F=F_n$ .

Load of the EUT is under maximum normal load.

The input current and wattage to the EUT shall be measured.

Multiple rated voltages or rated voltage range, each rated voltage shall be measured.

The current and power shall be taken under steady state conditions.

### Result:

|                                                                                                          |                                               |       |                        |       |        |                       |                    |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------|------------------------|-------|--------|-----------------------|--------------------|
| 27                                                                                                       | TABLE: Electrical data (in normal conditions) |       |                        |       |        |                       | Pass               |
| [ X ] Max. Available load                      [    ] All interfaces and wireless max. load transmission |                                               |       |                        |       |        |                       |                    |
| [    ] 1/8 of 100% or [    ] Max. available non-clipped output power                      _____          |                                               |       |                        |       |        |                       |                    |
| [    ] _____                                                                                             |                                               |       |                        |       |        |                       |                    |
| U (V)                                                                                                    | F (Hz)                                        | I (A) | I <sub>rated</sub> (A) | P (W) | Fuse # | I <sub>fuse</sub> (A) | Condition/status   |
| 240                                                                                                      | 50                                            | 2.19  | 2.5                    | 72.6  | F1     | 2.19                  | Charge the battery |
| 120                                                                                                      | 60                                            | 2.17  | 2.5                    | 71.5  | F1     | 2.17                  | Charge the battery |
| DC54.6V                                                                                                  | --                                            | 1.8   | 2.0                    | 70.9  | --     | --                    | Charge the battery |
|                                                                                                          |                                               |       |                        |       |        |                       |                    |
|                                                                                                          |                                               |       |                        |       |        |                       |                    |
|                                                                                                          |                                               |       |                        |       |        |                       |                    |
|                                                                                                          |                                               |       |                        |       |        |                       |                    |
|                                                                                                          |                                               |       |                        |       |        |                       |                    |
|                                                                                                          |                                               |       |                        |       |        |                       |                    |
| Voltage regulator: CTT01S ; Power meter: CTT15S; DC Electrical load: CTT48S;                             |                                               |       |                        |       |        |                       |                    |



## Temperature Test (28)

### Method:

EUT primary is  $U=U_n$ ,  $F=F_n$ , operated under normal max. load.

Temperatures of parts are measured by thermal couplers, windings are measured by resistance change method.

Measuring place shall be a point close to the heat source.

The test is continued until thermal stable.

Voltage is changed lower or higher tolerance without rest of time.

### Result:

| 28                                          | TABLE: Thermal requirements, |                |        |         |        |        | Pass                          |
|---------------------------------------------|------------------------------|----------------|--------|---------|--------|--------|-------------------------------|
|                                             | Supply voltage (V) .....     | DC54.6V        | --     | --      | --     | --     | —                             |
|                                             | Ambient Tmin (°C) .....      | 23.4           | --     | --      | --     | --     | —                             |
|                                             | Ambient Tmax (°C) .....      | 24.1           | --     | --      | --     | --     | —                             |
|                                             | Max. load                    | Charge battery | --     | --      | --     | --     |                               |
|                                             | Model                        | --             | --     | --      | --     | --     |                               |
| Maximum measured temperature T of part/at:: |                              | T (°C)         |        |         |        |        | Allowed Tmax (°C)             |
| Enclosure of Adaptor                        |                              | --             | --     | --      | --     | --     | 95                            |
| PCB near IC                                 |                              | 51.3           | --     | --      | --     | --     | 130                           |
| Internal wire                               |                              | 37.3           | --     | --      | --     | --     | 75                            |
| Capacitor                                   |                              | 41.1           | --     | --      | --     | --     | 105                           |
| Connector                                   |                              | 42.0           | --     | --      | --     | --     | 70                            |
| Battery                                     |                              | 31.8           | --     | --      | --     | --     | 60                            |
| Enclosure of battery                        |                              | 33.6           | --     | --      | --     | --     | 95                            |
| --                                          |                              |                |        |         |        |        |                               |
|                                             |                              |                |        |         |        |        |                               |
|                                             |                              |                |        |         |        |        |                               |
|                                             |                              |                |        |         |        |        |                               |
|                                             |                              |                |        |         |        |        |                               |
|                                             |                              |                |        |         |        |        |                               |
|                                             |                              |                |        |         |        |        |                               |
|                                             |                              |                |        |         |        |        |                               |
|                                             |                              |                |        |         |        |        |                               |
|                                             |                              |                |        |         |        |        |                               |
| Supplementary information:                  |                              |                |        |         |        |        |                               |
| Temperature T of winding:                   |                              | t1 (°C)        | R1 (Ω) | t2 (°C) | R2 (Ω) | T (°C) | Allowed T <sub>max</sub> (°C) |
| --                                          |                              | --             | --     | --      | --     | --     | --                            |
|                                             |                              |                |        |         |        |        |                               |





## Supplementary information:

- NF: No Fire
- NE: No Explosion
- NL: No Leakage
- NR: No Rupture
- NS: No Electric shock hazard
- Fire: the emission of flames from a cell or battery.
- Explosion: failure that occurs when a cell container or battery case opens violently and major components are forcibly expelled.
- Leakage: visible escape of liquid electrolyte.- Others (please explain)

## Result:

|                                             |                              |                   |        |         |        |        |                                  |
|---------------------------------------------|------------------------------|-------------------|--------|---------|--------|--------|----------------------------------|
| 28                                          | TABLE: Thermal requirements, |                   |        |         |        |        | Pass                             |
|                                             | Supply voltage (V) .....     | AC120V<br>60Hz    | --     | --      | --     | --     | —                                |
|                                             | Ambient Tmin (°C) .....      | 24.2              | --     | --      | --     | --     | —                                |
|                                             | Ambient Tmax (°C) .....      | 24.5              | --     | --      | --     | --     | —                                |
|                                             | Max. load                    | Charge<br>battery | --     | --      | --     | --     |                                  |
|                                             | Model                        | --                | --     | --      | --     | --     |                                  |
| Maximum measured temperature T of part/at:: |                              | T (°C)            |        |         |        |        | Allowed<br>Tmax<br>(°C)          |
| Enclosure of Adaptor                        |                              | 60.1              | --     | --      | --     | --     | 95                               |
| PCB near IC                                 |                              | 48.3              | --     | --      | --     | --     | 130                              |
| Internal wire                               |                              | 45.1              | --     | --      | --     | --     | 75                               |
| Capacitor                                   |                              | 56.1              | --     | --      | --     | --     | 105                              |
| Connector                                   |                              | 42.7              | --     | --      | --     | --     | 70                               |
| Battery                                     |                              | 37.6              | --     | --      | --     | --     | 60                               |
| Enclosure of battery                        |                              | 32.6              | --     | --      | --     | --     | 95                               |
| --                                          |                              |                   |        |         |        |        |                                  |
|                                             |                              |                   |        |         |        |        |                                  |
|                                             |                              |                   |        |         |        |        |                                  |
|                                             |                              |                   |        |         |        |        |                                  |
|                                             |                              |                   |        |         |        |        |                                  |
|                                             |                              |                   |        |         |        |        |                                  |
|                                             |                              |                   |        |         |        |        |                                  |
|                                             |                              |                   |        |         |        |        |                                  |
|                                             |                              |                   |        |         |        |        |                                  |
|                                             |                              |                   |        |         |        |        |                                  |
|                                             |                              |                   |        |         |        |        |                                  |
| Supplementary information:                  |                              |                   |        |         |        |        |                                  |
| Temperature T of winding:                   |                              | t1 (°C)           | R1 (Ω) | t2 (°C) | R2 (Ω) | T (°C) | Allowed<br>T <sub>max</sub> (°C) |
| --                                          |                              | --                | --     | --      | --     | --     | --                               |
|                                             |                              |                   |        |         |        |        |                                  |



## Supplementary information:

- NF: No Fire
- NE: No Explosion
- NL: No Leakage
- NR: No Rupture
- NS: No Electric shock hazard
- Fire: the emission of flames from a cell or battery.
- Explosion: failure that occurs when a cell container or battery case opens violently and major components are forcibly expelled.
- Leakage: visible escape of liquid electrolyte.- Others (please explain)

## Result:

|                                             |                              |                       |         |        |        |                               |                   |
|---------------------------------------------|------------------------------|-----------------------|---------|--------|--------|-------------------------------|-------------------|
| 28                                          | TABLE: Thermal requirements, |                       |         |        |        |                               | Pass              |
|                                             | Supply voltage (V) .....     | Power by full Battery | --      | --     | --     | --                            | —                 |
|                                             | Ambient Tmin (°C) .....      | 23.6                  | --      | --     | --     | --                            | —                 |
|                                             | Ambient Tmax (°C) .....      | 24.1                  | --      | --     | --     | --                            | —                 |
|                                             | Max. load                    | Max. load             | --      | --     | --     | --                            |                   |
|                                             | Model                        | --                    | --      | --     | --     | --                            |                   |
| Maximum measured temperature T of part/at.: |                              | T (°C)                |         |        |        |                               | Allowed Tmax (°C) |
| Enclosure of Adaptor                        |                              | --                    | --      | --     | --     | --                            | 95                |
| PCB near IC                                 |                              | 58.7                  | --      | --     | --     | --                            | 130               |
| Internal wire                               |                              | 41.4                  | --      | --     | --     | --                            | 75                |
| Capacitor                                   |                              | 42.8                  | --      | --     | --     | --                            | 105               |
| Connector                                   |                              | --                    | --      | --     | --     | --                            | 70                |
| Battery                                     |                              | 39.1                  | --      | --     | --     | --                            | 60                |
| Enclosure of battery                        |                              | 37.1                  | --      | --     | --     | --                            | 95                |
| Winding of Motor                            |                              | 46.9                  | --      | --     | --     | --                            | 70                |
| Enclosure of Motor                          |                              | 53.7                  | --      | --     | --     | --                            | 90                |
|                                             |                              |                       |         |        |        |                               |                   |
|                                             |                              |                       |         |        |        |                               |                   |
|                                             |                              |                       |         |        |        |                               |                   |
|                                             |                              |                       |         |        |        |                               |                   |
|                                             |                              |                       |         |        |        |                               |                   |
|                                             |                              |                       |         |        |        |                               |                   |
|                                             |                              |                       |         |        |        |                               |                   |
| Supplementary information:                  |                              |                       |         |        |        |                               |                   |
| Temperature T of winding:                   | t1 (°C)                      | R1 (Ω)                | t2 (°C) | R2 (Ω) | T (°C) | Allowed T <sub>max</sub> (°C) | Insulation class  |
| --                                          | --                           | --                    | --      | --     | --     | --                            | --                |



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |  |  |
| <p>Supplementary information:</p> <ul style="list-style-type: none"><li>- NF: No Fire</li><li>- NE: No Explosion</li><li>- NL: No Leakage</li><li>- NR: No Rupture</li><li>- NS: No Electric shock hazard</li><li>- Fire: the emission of flames from a cell or battery.</li><li>- Explosion: failure that occurs when a cell container or battery case opens violently and major components are forcibly expelled.</li><li>- Leakage: visible escape of liquid electrolyte.- Others (please explain)</li></ul> |  |  |  |  |  |  |  |

**Isolation Resistance Test (29)****Method:**

The test is made while the EUT is still in well-heated condition

Make sure the power switch of the EUT is in ON position.

Thin material can be tested in room temperature.

The test voltage is d.c. 500 voltage

Test voltage is applied gradually raised from zero to the specified voltage and held at that value for 60s.

|                                  |                                           |         |                |
|----------------------------------|-------------------------------------------|---------|----------------|
| 33                               | TABLE: Insulation resistance measurements |         | Pass           |
| Insulation resistance R between: |                                           | R (MΩ)  | Required R (Ω) |
| DC input and enclosure           |                                           | >100 MΩ | 50000Ω         |
| L/N and enclosure                |                                           | >100 MΩ | 50000Ω         |
| L/N and output                   |                                           | >100 MΩ | 50000Ω         |
|                                  |                                           |         |                |
|                                  |                                           |         |                |



## Dielectric Strength Test (30)

### Method:

The test is made while the EUT is still in well-heated condition

Make sure the power switch of the EUT is in ON position.

Thin material can be tested in room temperature.

The test voltage is a.c. of 50 or 60 Hz or d.c. voltage equal to peak value of the a.c. voltage.

Test voltage is applied gradually raised from zero to the specified voltage and held at that value for 60s.

Insulation breakdown is: Current flows through the insulation rapidly increases in an uncontrolled manner; that is the insulation does not restrict the flow of the current.

Corona discharge or a single momentary flashover is not regarded as insulation breakdown.

A test incorporating reinforced insulation and lower grades insulation (BI, SI), care is taken not to overstress BI or SI.

Where capacitors (X or Y capacitors) are across the insulation, d.c. voltage is recommended for the test.

Discharge resistors shall be disconnected before testing.

### Result:

| 30                            | Electric strength test |                  | Pass      |
|-------------------------------|------------------------|------------------|-----------|
| Test voltage applied between: |                        | Test voltage (V) | Breakdown |
| input and enclosure           |                        | AC1480 60Hz      | No        |
| Input and output              |                        | AC1480 60Hz      | No        |

**Humidity Conditioning (31)**

|                                                                                                |                                   |            |           |        |
|------------------------------------------------------------------------------------------------|-----------------------------------|------------|-----------|--------|
| 31                                                                                             | Humidity Conditioning Test        |            |           | Pass   |
| Test voltage: 48h, 90%R.H., 32°C                                                               |                                   |            |           |        |
| Measured point:                                                                                |                                   | Test V (V) | Measured  | Limit  |
| Input and Enclosure                                                                            |                                   | DC500V     | >100MΩ    | 30000Ω |
| Neutral and output accessible terminal                                                         |                                   | DC500V     | >100MΩ    | 30000Ω |
| Line and accessible enclosure surface                                                          |                                   | DC500V     | >100MΩ    | 30000Ω |
| Neutral and accessible enclosure surface                                                       |                                   | DC500V     | >100MΩ    | 30000Ω |
| Oscilloscope, Measuring circuit for touch current according to Annex D, Leakage Current Tester |                                   |            |           |        |
| 31                                                                                             | Dielectric Voltage-Withstand Test |            |           | Pass   |
|                                                                                                |                                   |            |           |        |
| Measured point:                                                                                |                                   | Test V (V) | Breakdown | Limit  |
| Line and output accessible terminal                                                            |                                   | AC 1480V   | No        | 100mA  |
| Neutral and output accessible terminal                                                         |                                   | AC 1480V   | No        | 100mA  |
| Line and accessible enclosure surface                                                          |                                   | AC 1480V   | No        | 100mA  |
| Neutral and accessible enclosure surface                                                       |                                   | AC 1480V   | No        | 100mA  |
| Oscilloscope, Measuring circuit for touch current according to Annex D, Leakage Current Tester |                                   |            |           |        |

**Abnormal Operation Test (32)**

| 32                                                                                                                                                                                                                                                                                            | Abnormal Operations and Fault Conditions Test |        | <b>Pass</b> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------|-------------|
| Requirement                                                                                                                                                                                                                                                                                   |                                               | Result | Remarks     |
| <b>During the test:</b>                                                                                                                                                                                                                                                                       |                                               |        |             |
| Fire propagates beyond the EUT?                                                                                                                                                                                                                                                               |                                               | Yes/No | --          |
| Molten metal emitted?                                                                                                                                                                                                                                                                         |                                               | Yes/No | --          |
| Enclosures deform to cause non-compliance with the standard?                                                                                                                                                                                                                                  |                                               | Yes/No | --          |
| <b>After the test:</b>                                                                                                                                                                                                                                                                        |                                               |        |             |
| Electric strength test on reinforced insulation breakdown?                                                                                                                                                                                                                                    |                                               | Yes/No | --          |
| Electric strength test on Basic insulation breakdown?                                                                                                                                                                                                                                         |                                               | Yes/No | --          |
| <b>SC:</b> Short-circuited; <b>OC:</b> Open-circuited; <b>OL:</b> Over-load; <b>BK:</b> Block; <b>RP:</b> Reverse-polarity;<br><b>LK:</b> Lock; <b>DC:</b> Disconnect; <b>OVC:</b> Overcharging under Max. available charging voltage or 106% rated voltage; <b>ED:</b> Excessive discharging |                                               |        |             |
| Voltage regulator, power meter, Data Acquisition/Switch Unit , Oscilloscope, Oscilloscope Probe, Digital Micro-ohmmeter, Withstanding Voltage Tester, DC Electrical load;                                                                                                                     |                                               |        |             |



| 32 Abnormal Operations and Fault Conditions Test |                                                                                                                  |                                                                                                                                                                                                                                                                   | Pass                                                                                                                                                                                                                                                                           |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient temperature (°C) .....                   |                                                                                                                  | 25.0°C                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                |
| Comp./ fault                                     |                                                                                                                  | Result / Observation                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                |
| U1 Pin 1-8                                       | Test voltage:<br>_DC54.6V_<br>Duration: _10min_<br>SC<br>No: __<br>I/P current (A): _1.22_<br>I/P power (W): __  | <input type="checkbox"/> Become steady, output power / current _____<br><input type="checkbox"/> Shut down immediately, and _____ damaged, can't be recovered, repeated _____ times.<br><input type="checkbox"/> Protected, can be recovered.                     | <input type="checkbox"/> Fuse opened immediately<br><input type="checkbox"/> Fuse opened after ____<br><input type="checkbox"/> T.F opened after ____<br><input type="checkbox"/> see raw data ____<br><input checked="" type="checkbox"/> No hazards<br>Remark: --            |
| U1 Pin 2-6                                       | Test voltage:<br>_DC54.6V_<br>Duration: _10min_<br>SC<br>No: __<br>I/P current (A): _1.17_<br>I/P power (W): __  | <input type="checkbox"/> Become steady, output power / current _____<br><input type="checkbox"/> Shut down immediately, and _____ damaged, can't be recovered, repeated _____ times.<br><input type="checkbox"/> Protected, can be recovered.                     | <input checked="" type="checkbox"/> Fuse opened immediately<br><input type="checkbox"/> Fuse opened after ____<br><input type="checkbox"/> T.F opened after ____<br><input type="checkbox"/> see raw data ____<br><input checked="" type="checkbox"/> No hazards<br>Remark: -- |
| U2 Pin 3-2                                       | Test voltage:<br>_DC54.6V_<br>Duration: _10min_<br>SC<br>No: __<br>I/P current (A): _0.12_<br>I/P power (W): _0_ | <input type="checkbox"/> Become steady, output power / current _____<br><input checked="" type="checkbox"/> Shut down immediately, and _____ No _____ damaged, can't be recovered, repeated _____ times.<br><input type="checkbox"/> Protected, can be recovered. | <input type="checkbox"/> Fuse opened immediately<br><input type="checkbox"/> Fuse opened after ____<br><input type="checkbox"/> T.F opened after ____<br><input type="checkbox"/> see raw data ____<br><input checked="" type="checkbox"/> No hazards<br>Remark: --            |
| U2 pin 3-4                                       | Test voltage:<br>_DC54.6V_<br>Duration: _10min_<br>SC<br>No: __<br>I/P current (A): _0.23_<br>I/P power (W): _0_ | <input type="checkbox"/> Become steady, output power / current _____<br><input checked="" type="checkbox"/> Shut down immediately, and _____ No _____ damaged, can't be recovered, repeated _____ times.<br><input type="checkbox"/> Protected, can be recovered. | <input type="checkbox"/> Fuse opened immediately<br><input type="checkbox"/> Fuse opened after ____<br><input type="checkbox"/> T.F opened after ____<br><input type="checkbox"/> see raw data ____<br><input checked="" type="checkbox"/> No hazards<br>Remark: --            |
| Battery                                          | Test voltage:<br>_DC54.6V_<br>Duration: _10min_<br>SC<br>No: __<br>I/P current (A): _0_<br>I/P power (W): _0_    | <input type="checkbox"/> Become steady, output power / current _____<br><input checked="" type="checkbox"/> Shut down immediately, and _____ No _____ damaged, can't be recovered, repeated _____ times.<br><input type="checkbox"/> Protected, can be recovered. | <input type="checkbox"/> Fuse opened immediately<br><input type="checkbox"/> Fuse opened after ____<br><input type="checkbox"/> T.F opened after ____<br><input type="checkbox"/> see raw data ____<br><input checked="" type="checkbox"/> No hazards<br>Remark:               |
| Adaptor output                                   | Test voltage: AC120V_<br>Duration: _10min_<br>SC<br>No: __<br>I/P current (A): __<br>I/P power (W): _1.47_       | <input type="checkbox"/> Become steady, output power / current _____<br><input checked="" type="checkbox"/> Shut down immediately, and _____ No _____ damaged, can't be recovered, repeated _____ times.<br><input type="checkbox"/> Protected, can be recovered. | <input type="checkbox"/> Fuse opened immediately<br><input type="checkbox"/> Fuse opened after ____<br><input type="checkbox"/> T.F opened after ____<br><input type="checkbox"/> see raw data ____<br><input checked="" type="checkbox"/> No hazards<br>Remark: --            |





|              |                                                                                                                                       |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Locked Motor | Test voltage: _54.6V_<br>Duration: _2h_<br>Fuse or Fuse resistor<br>No: _ _<br>I/P current (A): _Max.<br>1.39A_<br>I/P power (W): _0_ | <input type="checkbox"/> Become steady, output power<br>/ current _____<br><input type="checkbox"/> Shut down immediately, and<br>_____ damaged, can't be<br>recovered, repeated _____ times.<br><input checked="" type="checkbox"/> Protected, can be recovered. | <input type="checkbox"/> Fuse opened immediately<br><input type="checkbox"/> Fuse opened after ____<br><input type="checkbox"/> T.F opened after ____<br><input type="checkbox"/> see raw data ____<br><input checked="" type="checkbox"/> No hazards<br>Winding of motor:75.4°C<br>Remark: -- |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Impact Test (33)**

| 33                                                                                                                                 | TABLE: Strain relief test |              |                          | Pass |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------|--------------------------|------|
| Test part                                                                                                                          | Temperature (°C)          | Duration (h) | Result                   |      |
| Enclosure                                                                                                                          | 70                        | 1h           | Pass electrical strength |      |
| Notes:                                                                                                                             |                           |              |                          |      |
| Oven temperature shall be 10 K higher than the maximum temperature on the enclosure but not less than 70°C.                        |                           |              |                          |      |
| supplementary information:                                                                                                         |                           |              |                          |      |
| - NF: No Fire                                                                                                                      |                           |              |                          |      |
| - NE: No Explosion                                                                                                                 |                           |              |                          |      |
| - NL: No Leakage                                                                                                                   |                           |              |                          |      |
| - Fire: the emission of flames from a cell or battery.                                                                             |                           |              |                          |      |
| - Explosion: failure that occurs when a cell container or battery case opens violently and major components are forcibly expelled. |                           |              |                          |      |
| - Leakage: visible escape of liquid electrolyte.- Others (please explain)                                                          |                           |              |                          |      |

| 33         | TABLE: Impact test Vertically   |                       |                   | Pass    |
|------------|---------------------------------|-----------------------|-------------------|---------|
| Model      | weighing                        | Test temperature (°C) | Impact energy (J) | Results |
| Enclosure  | 0.535kg, D:50.8mm               | 25                    | 6.8J              | P       |
| Enclosure  | 0.535kg, D:50.8mm               | 25                    | 6.8J              | P       |
| Enclosure  | 0.535kg, D:50.8mm               | 25                    | 6.8J              | P       |
| No damage. |                                 |                       |                   |         |
| 33         | TABLE: Impact test Horizontally |                       |                   | Pass    |
| Model      | weighing                        | Test temperature (°C) | Impact energy (J) | Results |
| Enclosure  | 0.535kg, D:50.8mm               | 25                    | 6.8J              | P       |
| Enclosure  | 0.535kg, D:50.8mm               | 25                    | 6.8J              | P       |
| Enclosure  | 0.535kg, D:50.8mm               | 25                    | 6.8J              | P       |
| No damage. |                                 |                       |                   |         |

**Mold Stress (34)**

| 34                                                                                                                                 | TABLE: Strain relief test |              |                          | Pass |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------|--------------------------|------|
| Test part                                                                                                                          | Temperature (°C)          | Duration (h) | Result                   |      |
| Enclosure                                                                                                                          | 70                        | 1h           | Pass electrical strength |      |
| Notes:                                                                                                                             |                           |              |                          |      |
| Oven temperature shall be 10 K higher than the maximum temperature on the enclosure but not less than 70°C.                        |                           |              |                          |      |
| supplementary information:                                                                                                         |                           |              |                          |      |
| - NF: No Fire                                                                                                                      |                           |              |                          |      |
| - NE: No Explosion                                                                                                                 |                           |              |                          |      |
| - NL: No Leakage                                                                                                                   |                           |              |                          |      |
| - Fire: the emission of flames from a cell or battery.                                                                             |                           |              |                          |      |
| - Explosion: failure that occurs when a cell container or battery case opens violently and major components are forcibly expelled. |                           |              |                          |      |
| - Leakage: visible escape of liquid electrolyte.- Others (please explain)                                                          |                           |              |                          |      |

| 34                                                                                             | TABLE: Insulation resistance measurements |            |           | Pass   |
|------------------------------------------------------------------------------------------------|-------------------------------------------|------------|-----------|--------|
| Measured point:                                                                                |                                           | Test V (V) | Measured  | Limit  |
| Input and Enclosure                                                                            |                                           | DC500V     | >100MΩ    | 30000Ω |
| Neutral and output accessible terminal                                                         |                                           | DC500V     | >100MΩ    | 30000Ω |
| Line and accessible enclosure surface                                                          |                                           | DC500V     | >100MΩ    | 30000Ω |
| Neutral and accessible enclosure surface                                                       |                                           | DC500V     | >100MΩ    | 30000Ω |
| Oscilloscope, Measuring circuit for touch current according to Annex D, Leakage Current Tester |                                           |            |           |        |
| 34                                                                                             | Dielectric Voltage-Withstand Test         |            |           | Pass   |
| Measured point:                                                                                |                                           | Test V (V) | Breakdown | Limit  |
| Line and output accessible terminal                                                            |                                           | AC 1480V   | No        | 100mA  |
| Neutral and output accessible terminal                                                         |                                           | AC 1480V   | No        | 100mA  |
| Line and accessible enclosure surface                                                          |                                           | AC 1480V   | No        | 100mA  |
| Neutral and accessible enclosure surface                                                       |                                           | AC 1480V   | No        | 100mA  |
| Oscilloscope, Measuring circuit for touch current according to Annex D, Leakage Current Tester |                                           |            |           |        |



## Ingress Protection Tests (36)

### Test procedure

For IPX4, the sample is positioned under oscillating spray tubes rotating at nearly  $\pm 180^\circ$  from the vertical for 10 minutes. The oscillation rate is two cycles of about  $360^\circ$  in 12 seconds. Each surface of the enclosure within the spray arch is to be tested for 1 min/m<sup>2</sup>, with no less than 5 minutes of total test time. The flow rate again depends upon the tube size, Withstand voltage test is pass, No harmful effects

|                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|
| IPX4                                                                                                                                                                                                                                                                                                                                                                                                                                     | -For IPX4, the sample is positioned under oscillating spray tubes rotating at nearly $\pm 180^\circ$ from the vertical for 10 minutes. The oscillation rate is two cycles of about $360^\circ$ in 12 seconds. Each surface of the enclosure within the spray arch is to be tested for 1 min/m <sup>2</sup> , with no less than 5 minutes of total test time. The flow rate again depends upon the tube size, Withstand voltage test is pass, No harmful effects | No harmful effects | Pass |
| supplementary information: <ul style="list-style-type: none"><li>- NF: No Fire</li><li>- NE: No Explosion</li><li>- NL: No Leakage</li><li>- Fire: the emission of flames from a cell or battery.</li><li>- Explosion: failure that occurs when a cell container or battery case opens violently and major components are forcibly expelled.</li><li>- Leakage: visible escape of liquid electrolyte.- Others (please explain)</li></ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |      |



Permanence of Marking (37)

|                 |                     |                         |                     |      |
|-----------------|---------------------|-------------------------|---------------------|------|
| 37              | MARKING DURABILITY  |                         | Durable and legible |      |
| Type of marking | 15 seconds of water | 15 seconds of petroleum | Pass                | Fail |
| Rating label    | --                  | --                      | √                   | --   |
| Stop watch      |                     |                         |                     |      |

**Vibration Test (38)**

|                                |                                         |                     |                    |         |   |
|--------------------------------|-----------------------------------------|---------------------|--------------------|---------|---|
| 38                             | TABLE: Vibration tests                  |                     |                    |         | P |
| Model                          | OCV at start of test, (Vdc) for battery | Test frequency (Hz) | Vibration time (h) | Results |   |
| Electric bicycle               | Fully                                   | 10Hz~55Hz~10Hz      | 1h                 | P       |   |
| Electric bicycle               | Fully                                   | 10Hz~55Hz~10Hz      | 1h                 | P       |   |
| Electric bicycle               | Fully                                   | 10Hz~55Hz~10Hz      | 1h                 | P       |   |
| Supplementary information:     |                                         |                     |                    |         |   |
| - NF: No Fire                  |                                         |                     |                    |         |   |
| - NE: No Explosion             |                                         |                     |                    |         |   |
| - NL: No Leakage               |                                         |                     |                    |         |   |
| - NR: No Rupture               |                                         |                     |                    |         |   |
| - NS: No Electric shock hazard |                                         |                     |                    |         |   |
| - No loosening of parts        |                                         |                     |                    |         |   |
| - Operate normally.            |                                         |                     |                    |         |   |

**Strain-Relief Test pull test (39)**

| Pull Location  | Samples | Force        | Observations                                  | Pass |      |
|----------------|---------|--------------|-----------------------------------------------|------|------|
|                |         |              |                                               | Pass | Fail |
| Connector wire | 1#      | 35lbs (156N) | No damaged, no breakage, without displacement | ✓    |      |
| Connector wire | 2#      | 35lbs (156N) | No damaged, no breakage, without displacement | ✓    |      |
| Connector wire | 3#      | 35lbs (156N) | No damaged, no breakage, without displacement | ✓    |      |

**push back test (39)**

| Pull Location              | Samples | Force        | Observations            | Pass |      |
|----------------------------|---------|--------------|-------------------------|------|------|
|                            |         |              |                         | Pass | Fail |
| Connector wire with switch | 1#      | 6lbs (26.7N) | No damaged, no breakage | ✓    |      |
| Connector wire with switch | 2#      | 6lbs (26.7N) | No damaged, no breakage | ✓    |      |
| Connector wire with switch | 3#      | 6lbs (26.7N) | No damaged, no breakage | ✓    |      |



## Photo documentation

Photo 1 Over view



Photo 2 Over view







Photo 3 Over view



Photo 4 Over view





Photo 5 Over view



\*\*\*The end of report\*\*\*