TEST REPORT

Applicant's name. .....:	INMOTION TECHNOLOGIES CO., LTD.
Address. .....:	18F, B1, Nanshan i Park, No. 1001 Xueyuan Ave, Nanshan District, Shenzhen, China
Manufacturer name. .....:	INMOTION TECHNOLOGIES CO., LTD.
Address. .....:	18F, B1, Nanshan i Park, No. 1001 Xueyuan Ave, Nanshan District, Shenzhen, China
Factory's name. .....:	DONGGUAN BLC ROBOT CO.,LTD.
Address. .....:	Room 201, Building 1, No.2, Youlian Road, Qiaotou Town Dongguan, Guangdong, China
Testing laboratory. .....:	GUANGDONG UTL CO., LTD.
Address. .....:	Lianding Testing Building, No.18 Center Road of Yayuan Industrial Zone, Nancheng District, Dongguan, Guangdong, China
Test item description. .....:	Electric Scooter
Model/Type reference .....:	RS series (RS maybe followed by letter, number or blank.)
Trademark .....:	INMOTION
Ratings. .....:	Input: 84V, 5A
Sample No. .....:	SLine-1-1 & SLine-1-2 for Electric unicycle, SLine-2-1 ~ SLine-2-5 for Battery
Total pages. .....:	85
Test item. .....:	See next page for details
Test standard. .....:	ANSI /UL-2272: February 25, 2019
Test result. .....:	Pass
Date of receipt of sample. .....:	2023-07-22
Date(s) of performance of test. .....:	2023-07-24 to 2023-08-10

.....	Ivy Bi	.....
Tested: Benny Xu	Checked: Ivy Bi	Approved: Andy Huang
Date: 2023-08-15	Date: 2023-08-15	Date: 2023-08-15

No.	UL 2272 Section	Test Items	Verdicts
1	25	SHORT CIRCUIT TEST	P
2	27	TEMPERATURE	P
3	28	DIELECTRIC VOLTAGE WITHSTAND TEST	P
4	33	VIBRATION TEST	P
5	34	SHOCK TEST	P
6	35	CRUSH TEST	P
7	36	DROP TEST	P
8	37	MOLD STRESS RELIEF TEST	P
9	38	HANDLE LOADING TEST	P
10	39	MOTOR OVERLOAD	P
11	40	MOTOR LOCKED ROTOR TEST	P
12	42	WATER EXPOSURE TEST	P
13	43	THERMAL CYCLING TEST	P
14	24	Overcharge Test	P
15	26	Overdischarge Test	P
16	28	Imbalanced Charging Test	P
No.	**UL 2580 Section**	**Test Items**	**Verdicts**
17	B2.7	SHORT CIRCUIT TEST:	P
18	B2.8	OVERCHARGE TEST:	P
19	B2.5	HEATING TEST:	P
20	B2.10	PROJECTILE TEST:	P
Possible test case verdicts:			
- Test case does not apply to the test object:			N/A

- Test object does meet the requirement…:	P (Pass)
- Test object does not meet the requirement:	F (Fail)
Model difference and remark:	
N/A	

SHORT CIRCUIT TEST UL 2272,25

METHOD

A fully charged sample of the DUT was to have the battery terminals short-circuited by connecting the positive and negative terminals of the battery with a circuit load having a total resistance of less than or equal to 20 mΩ.

Prior to subjecting the DUT to the external short, it was subjected to a single fault across any protective device in the load circuit of the battery.

Protective devices that were determined reliable remained in the circuit for the test.

The DUT was under load until:

- It had returned to ambient temperature or
- Fire or explosion occurred.
- Or a maximum of 3 hours

Temperatures were measured on the DUT battery for monitoring purposes.

If the DUT was operational after the test, the external short was removed and the DUT was subjected to a minimum of one charge/discharge cycle at the manufacturer's maximum specified values. The test was followed by an observation period.

If a protective device in the circuit operated, the test was repeated at 90% of the trip point of the protection device or at some percentage of the trip point that allows discharging for at least 10 min.

At the conclusion of the test and after cooling to near ambient, a DUT that contained hazardous voltage circuits was subjected to a Dielectric Voltage Withstand Test or Isolation Resistance Test (without humidity conditioning).

RESULTS

Test Date	2023-08-02
Laboratory Ambient, °C	26.7
Model No.:	LR1726V

Sample No.	Short Circuit	Short Location	Fault Condition	Max Measured Temp on battery, °C	Measured Ext. Resistance, mΩ	Protection Tripped, Y or N?	Results
SLine-2-3	--	A	Short Q59	27.9	19.5	Y(F2,F3 open)	N
SLine-2-4	--	B	Short Q1	27.7	19.5	Y(F1 open)	N
					Meas. Current, A		
SLine-2-5	Repeat at 90% Trip point current	A	Short Q59	40.8	234&	Y(F2,F3 open)	N
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--

Results Key
N – no fire, no explosion, no leakage, no rupture, and insulation remained intact if applicable
O – Operational after test
F/E – evidence of fire and/or explosion
R – evidence of rupture
L – evidence of external leakage
S – evidence of insulation breakdown (electric shock hazard)
X – Other (explain)
Short Location: A: battery pack output terminals B: Scooter inputs C: Scooter outputs if applicable

Insulation Check				
Sample No.	Dielectric Voltage Withstand Test Voltage, V	Insulation Resistance Voltage, Vdc	Resistance Measured, Ohms	Dielectric Breakdown, Y or N?
SLine-2-3	168Vdc	--	--	N
SLine-2-4	168Vdc	--	--	N
SLine-2-5	168Vdc	--	--	N

As a result of the short circuit test, there **[**was**] [**was no**]** evidence of:

a) Explosion;

b) Fire;

d) Rupture (enclosure);

e) Electrolyte Leakage (external to enclosure.

[X] There ~~**[**was**]**~~ **[**was no**]** evidence of an electric shock hazard introduced as a result of the short circuit test.

~~**[ ]** The insolation resistance **[**was**] [**was not**]** less than 50,000 Ω~~

&: Short Q59 Max. trip current is 260A,Test was repeated at 90% of the trip point of the protection device: 260A X 90%=234A.

TEMPERATURE UL 2272,27

METHOD

A fully discharged DUT (i.e. discharged to EODV) was conditioned within a chamber set to the upper limit charging temperature specifications of the DUT. After thermal stabilization in the chamber, the DUT was connected to a charging circuit input representative of anticipated maximum charging parameters. The DUT was then subjected to maximum normal charging while monitoring voltages and currents on cells until it reached the manufacturer's specified fully charged condition.

Temperatures were monitored on temperature sensitive components including cells and on any user accessible surfaces.

While still in the conditioning chamber, and after allowing temperatures to stabilize, the fully charged DUT was then discharged in accordance with the manufacturer's specifications down to the manufacturer's specified end of discharge condition while monitoring voltage and current on cells until the DUT reached its specified EODV. Temperatures were monitored on temperature sensitive safety critical components including cells and on any user accessible surfaces.

Note: The method of simulating the maximum continuous electrical load for discharging the batteries may vary according to the scooter design and should be a method agreed upon by the manufacturer and organization testing the scooter. The methods to simulate this loading can include the use of a dynamometer or other mechanical loading means, or manipulation of the electrical and electronic control circuit(s) to simulate loading on the motor. Factors to be considered when determining the maximum continuous electrical load during discharge include maximum weight of rider, maximum speed of movement, angle of movement and loads from auxiliary devices such as lights, audio, etc. that may be operating when the scooter is moving. If there is a need to consider the surface impact to loading, concrete is to be used to represent typical outdoor operating surfaces.

The charge and discharge cycles were then repeated for a total of 2 complete cycles of charge and discharge in the maximum ambient.

During the temperature test, the voltage, temperature and current during discharge and charging of the component cells was monitored to determine that the values were not outside of the specified cell manufacturer's operating region.

At the conclusion of the observation period, the samples with hazardous voltage circuits were subjected to an Isolation Resistance Test (without humidity conditioning) or a Dielectric Voltage Withstand Test.

RESULTS

DUT: V11	
Specified Max. Charging Ambient, °C:	40
Specified Max. Operating Ambient, °C:	40
Maximum specified rider weight, lbs	150
Determined maximum continuous discharge current based upon loading considerations, A	100
Method to achieve maximum continuous discharge current load on sample:	--
Sample No.	SLine-1-1
Test Date	2023-07-31 to 2023-08-03
Room Ambient, °C:	26.1/26.5/24.7/26.5

Location of Thermocouple	Maximum Measured Temperatures, °C								
	Discharging				Charging				Spec. Limit
	25±5℃		Max Ambient		25±5℃		Max Ambient		
Cycle No.	1	2	1	2	1	2	1	2	
1.Battery charge wire	56.1	56.1	69.6	69.6	32.8	32.0	46.7	47.3	80
2.Battery charge connector	60.5	60.3	74.0	73.8	30.1	29.0	44.0	44.3	80
3.Battery discharge connector	62.0	62.4	75.5	75.9	31.9	30.7	45.8	46.0	130
4.Battery discharge wire	63.2	63.1	76.7	76.6	32.7	31.7	46.6	47.0	80
5.Battery PCB near Q71, Q72	72.8	73.2	86.3	86.7	46.3	45.9	60.2	61.2	105
6.Battery PCB near Q65, Q66	66.7	66.8	80.2	80.3	72.6	72.0	86.5	87.3	105
7.Battery PCB near R280, R281	75.8	76.2	89.3	89.7	41.2	40.6	55.1	55.9	105
8.Cell 1	64.5	63.8	68.0	77.3	32.8	31.8	46.7	47.1	70
9.Cell 2	65.3	64.4	68.8	77.9	32.4	31.2	46.3	46.5	70
10.Cell 3	64.6	63.6	68.1	77.1	30.7	31.5	44.6	46.8	70
11.Cell 4	65.5	64.7	69.0	78.2	32.5	31.5	46.4	46.8	70
12.Battery PCB near U1	71.2	71.3	84.7	84.8	38.2	37.2	52.1	52.5	105
13.C65	57.7	56.6	71.2	70.1	27.3	25.9	41.2	41.2	105
14.Main board	69.1	67.9	82.6	81.4	26.9	25.8	40.8	41.1	105

PCB near MOS12,MOS17									
15.Motor connector	51.1	50.3	64.6	63.8	26.8	25.6	40.7	40.9	65
16.Main board PCB near U1	58.4	56.9	71.9	70.4	26.6	25.5	40.5	40.8	105
17.Motor wire	53.6	52.7	67.1	66.2	26.8	25.5	40.7	40.8	80
18.Input Charging Terminal	42.0	41.1	55.5	54.6	28.0	26.3	41.9	41.6	80
19.Plastic enclosure inside	32.3	31.4	45.8	44.9	26.2	24.9	40.1	40.2	85
20.Plastic enclosure outside	28.6	29.0	42.1	42.5	26.2	24.8	40.1	40.1	85
21.Metal enclosure outside near battery and Controller	38.0	36.9	51.5	50.4	26.7	25.8	40.6	41.1	70
22.Motor 1 winding	65.0	61.7	78.5	75.2	27.1	25.5	41.0	40.8	105
23.Motor 1 winding	64.9	61.5	78.4	75.0	26.9	25.4	40.8	40.7	105
24.Motor 1 winding	64.4	60.8	77.9	74.3	26.8	25.3	40.7	40.6	105
25.Motor 1 PCB	64.5	60.6	78.0	74.1	26.5	25.4	40.4	40.7	130
26.Motor 1 inside wire	58.4	55.0	71.9	68.5	26.4	25.2	40.3	40.5	105
27.Motor 2 winding	85.8	86.1	99.3	99.6	27.6	27.5	41.5	42.8	105
28.Motor 2 winding	84.9	85.2	98.4	98.7	27.4	27.4	41.3	42.7	105
29.Motor 2 winding	83.6	83.7	97.1	97.2	27.8	26.8	41.7	42.1	105
30.Motor 2 PCB	83.8	84.6	97.3	98.1	27.6	27.1	41.5	42.4	130
31.Motor 2 inside wire	77.2	77.0	90.7	90.5	27.5	26.6	41.4	41.9	105
32.LED light	34.2	33.1	47.7	46.6	26.8	25.2	40.7	40.5	120
33.Handle	28.1	29.3	41.6	42.8	26.5	24.8	40.4	40.1	85
34.Ambient	26.5	26.5	40.0	40.0	26.1	24.7	40.0	40.0	--
	Min Measured Voltage, Vdc				Max Measured Voltage, Vdc				
Cell No 1	2.984	2.950	--	--	4.198	4.198	--	--	Charge:4.325V Discharge: 2.5V
Cell No 2	2.982	2.924	--	--	4.196	4.197	--	--	
Cell No 3	3.044	3.010	--	--	4.200	4.200	--	--	
Cell No 4	2.959	2.910	--	--	4.200	4.200	--	--	
Cell No 5	3.022	2.991	--	--	4.202	4.202	--	--	
Cell No 6	3.059	3.015	--	--	4.203	4.204	--	--	
Cell No 7	3.004	2.972	--	--	4.209	4.200	--	--	
Cell No 8	3.029	2.990	--	--	4.204	4.204	--	--	

Cell No 9	2.981	2.955	--	--	4.196	4.196	--	--	
Cell No 10	2.977	2.931	--	--	4.197	4.197	--	--	
Cell No 11	3.044	3.005	--	--	4.200	4.197	--	--	
Cell No 12	2.956	2.915	--	--	4.200	4.197	--	--	
Cell No 13	3.022	2.985	--	--	4.201	4.202	--	--	
Cell No 14	3.054	3.008	--	--	4.206	4.204	--	--	
Cell No 15	2.999	2.980	--	--	4.197	4.197	--	--	
Cell No 16	3.029	2.986	--	--	4.197	4.201	--	--	
Cell No 17	3.038	2.972	--	--	4.202	4.200	--	--	
Cell No 18	2.959	2.983	--	--	4.203	4.198	--	--	
Cell No 19	3.015	2.943	--	--	4.205	4.200	--	--	
Cell No 20	3.052	2.924	--	--	4.200	4.199	--	--	
	Max Meas. Discharge Current, A				Max Meas. Charge Current, A				
Battery current	60.8	60.2	--	--	4.95	4.96	--	--	Discharge current:100A/charge:5.0A

The cell manufacturer's specified limits (voltage, current and temperatures measured) **[**~~were~~**]** **[**were not**]** exceeded during the charging and discharging cycles.

Temperatures measured on components **[**~~did~~**]** **[**did not**]** exceed their specifications.

DIELECTRIC VOLTAGE WITHSTAND TEST UL 2272,28

METHOD

DUTs with circuits at 60 Vdc (or 30 Vrms / 42.4 Vpk) or higher were subjected to a dielectric withstand voltage consisting of one of the following:

1) for dc circuits isolated from mains -
- a dc potential of twice the rated voltage of the circuit under test, or
- an essentially sinusoidal ac potential of frequency between 40 - 70 Hz at twice rated voltage of the circuit under test

2) for ac circuits or dc circuits not isolated from mains -
- an ac potential of 1000 plus two times the voltage of the circuit under test or
- a dc potential of 1.414 times 1000 V plus two times the voltage of the circuit under test

The test voltages were applied for a minimum of 1 minute with the cells disconnected to prevent charging during application of the voltage.

Semiconductors or similar electronic components not relied upon for protection from electric shock and liable to be damaged by application of the test voltage were bypassed or disconnected.

The test voltage was applied between the hazardous voltage circuits of the DUT and non-current carrying conductive parts that were accessible. The test voltage was also applied between the hazardous voltage charging circuit and the enclosure/accessible non-current carrying conductive parts of the DUT.

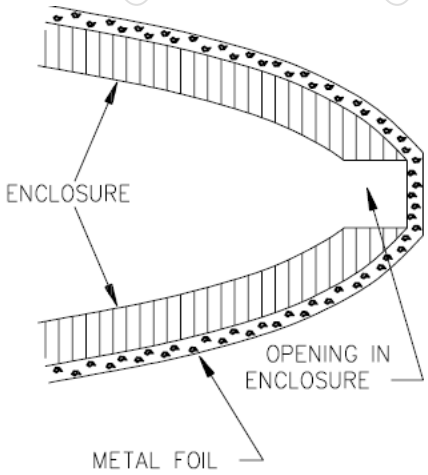
If accessible part of the DUT were covered with insulating material that could become live in the event of an insulation fault, then the test voltages were applied between each of the live parts and metal foil in contact with the accessible parts. The metal fail was drawn tightly across any opening in the enclosure or other accessible parts to form a flat plane across such an opening per the figure below.

The test equipment used consisted of a 500 VA or larger capacity transformer, the output voltage which is variable and which was essentially sinusoidal if using the ac test method or a dc output if using the dc tests method.

DIELECTRIC VOLTAGE WITHSTAND TEST (CONT'D): UL 2272 ,29

Note: There was no trip current setting for the test equipment since the test was checking for insulation breakdown, which results in a large increase of current. Setting a trip current may result in a false failure of this test as it may not be indicative of insulation breakdown.

Figure – Method of covering enclosures with foil



DIELECTRIC VOLTAGE WITHSTAND TEST (CONT'D): UL 2272 ,29

RESULTS

DUT:	RS
Test Date	2023-07-24
Lab Ambient, °C	27.5
Sample No.	SLine-1-2

Location of insulation under test	Test Potential **[** Vdc**]**~~[Vac]~~	Breakdown? Y or N
Insulation between positive terminal and accessible parts	168	N
Insulation between negative terminal and accessible parts	168	N
Insulation between charging circuit and accessible parts	168	N

As a result of applied potential, there ~~[was]~~ **[**was no**]** evidence of dielectric breakdown between the locations tested.

Note: Evidence of dielectric breakdown (breakdown of insulation resulting in a short through insulation/arcing over electrical spacings) was evidenced by an appropriate signal form the dielectric withstand equipment as a result of the applied test voltage. Corona discharge or a single momentary discharge was not regarded as a dielectric breakdown (i.e. insulation breakdown).

VIBRATION TEST UL 2272,33

METHOD

The test was performed in accordance with one of the following methods:

- the Standard for Batteries for Light Electric Vehicles, UL 2271, Section 30, Vibration Endurance Test without the temperature variation (refer to ISO 12405-1 random vibration method), or
- According to a test profile determined by the customer and verified to the LEV application.

The fully charged DUT was securely mounted to a vibration test platform. The DUT was subjected to a vibration along three perpendicular axes.

If conducting the ISO 12405-1 random vibration method (without temperature variation), the DUT was subjected to the vibration in each axis for 21 h if testing one sample, 15 h if testing two samples or 12 h if testing 3 samples. For each axis the frequency was varied from 5 Hz to 200 Hz with power spectral density (PSD) as outlined in the Table below.

Table - Test parameters for UL 2271 Vibration Endurance (Random Vibration)			
Axis	**Frequency**	**PSD**	**PSD**
	Hz	**g^2/Hz**	**$(m/s^2)^2$/Hz**
Z (vertical)	5	0.05	4.81
	10	0.06	5.77
	20	0.06	5.77
	200	0.0008	0.08
	rms	**1.44 g**	**14.13 m/s^2**
Y (transverse)	5	0.04	3.85
	10	-	-
	20	0.04	3.85
	200	0.0008	0.08
	rms	**1.23 g**	**12.07 m/s^2**
X (longitudinal)	5	0.0125	1.20
	10	0.03	2.89
	20	0.03	2.89

	200	0.00025	0.02
	rms	**0.96 g**	**9.42 m/s²**

If the DUT was operational after the test, it was subjected to a minimum of one discharge/charge cycle at the manufacturer's maximum specified values. If not operational, a charge was attempted. The test shall be followed by a one hour observation period.

At the conclusion of the observation period, the samples with hazardous voltage circuits shall be subjected to a Dielectric Voltage Withstand Test or Isolation Resistance Test (without humidity conditioning).

RESULTS

DUT:	RS
Test Date	2023-07-25 to 2023-07-28
Lab Ambient, °C	27.2/26.8/27.4/27.6
Vibration Method Used for Test:	[random][specific to scooter]
Dielectric voltage test value, V	168Vdc
Isolation resistance Voltage, Vdc	--

Sample No.	Initial OCV, Vdc	Final OCV, Vdc	Max Temp on Cell/Mod, °C	Length of vibration, h	Results
SLine-1-2	83.3	83.2	--	21h(Axis: Z)	N,O
SLine-1-2	83.2	83.0	--	21h(Axis: Y)	N,O
SLine-1-2	83.0	83.0	--	21h(Axis: X)	N,O
	Dielectric Voltage Breakdown Y or N		Measured Isolation Resistance Ω		
SLine-1-2	N		--		
--	--		--		

Results Key	
E – Explosion	L – Electrolyte Leakage (external to enclosure)
F - Fire	S – Electric shock (dielectric breakdown or resistance below isolation resistance limits
R – Rupture	N - No evidence of noncompliant results
O – Operational after test	

[ ] See also attached vibration spectra for details of vibrations applied.

As a result of the vibration, the samples **[**~~did~~**]** **[**did not**]** catch fire or explode during the test or at the conclusion of the rest period. There **[**~~was~~**]** **[**was no**]** evidence of electrolyte leakage or signs or rupture of the battery enclosure.

[X] There **[**~~was~~**]** **[**was no**]** evidence of **[**dielectric breakdown**]**

~~**[ ]** The insolation resistance **[**was**]** **[**was not**]** less than **[**50,000 Ω**]**.~~

SHOCK TEST UL 2272,34

METHOD

A fully charged sample of the personal e-mobility device was secured to the testing machine by means of a rigid mount, which supported all mounting surfaces of the sample. Temperatures on the center cell were monitored for information purposes.

The sample was subjected to mechanical shock testing with parameters as shown in Table below or according to a test profile determined by the customer and verified to the personal e-mobility device application. When considering the level of shock, the weight of the DUT and maximum specified weight of the rider was considered.

The battery was tested first separately from the personal e-mobility device with the higher shock levels for lighter devices noted in the Table prior to testing the complete assembly. The shocks were applied in all 6 spatial directions.

Table - Shock parameters

DUT and Maximum Allowed Rider Weight	Pulse shape	Acceleration	Duration	Number of shocks
~~≤ 12 kg~~	~~half-sinusoidal~~	~~50 g~~	~~11 ms~~	~~3 ⊥ directions~~
~~> 12 ≤ 100 kg~~	~~—~~	~~25 g~~	~~15 ms~~	~~3 ⊥ directions~~
> 100 kg[a]	-	10 g	20 ms	3 ⊥ directions
[a] Battery pack previously tested individually outside of personal e-mobility device to the appropriate higher shock level per its weight.				

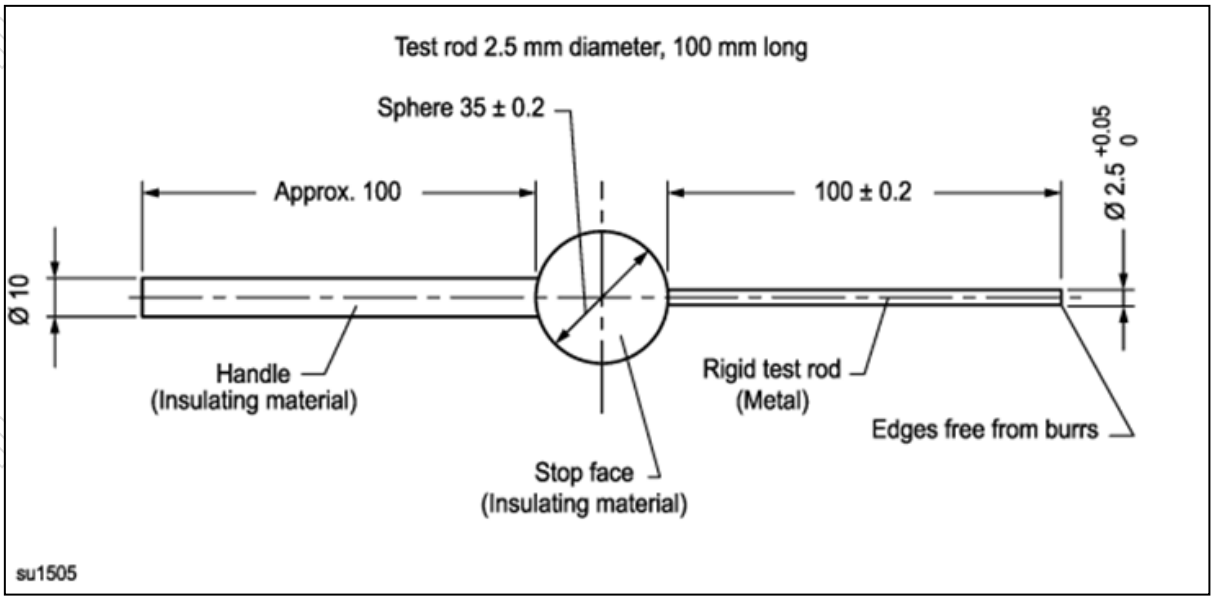
If the DUT was operational after the test, it was subjected to a minimum of one charge/discharge cycle at the manufacturer's maximum specified values. If not operational, it was subjected to an attempted charge only. The test was followed by a 1 hour observation period.

At the conclusion of the observation period, the samples with hazardous voltage circuits were subjected to a Dielectric Voltage Withstand Test or Isolation Resistance Test without humidity conditioning.

Note：DUT> 12 ≤ 100 kg, and Maximum Allowed Rider Weight>100 kg, so test condition pick the second and third from Table – Shock Parameters.

[X**]** The sample was examined with the probe of 9.1.3 to determine if it was possible to access hazardous parts if applicable.

Figure – IEC 2.5 mm diameter test rod



RESULTS

DUT:	LR1726V / RS
Test Date:	2023-07-24
Lab Ambient, °C	26.7
Weight of DUT, kg	LR1726V:16.05
Maximum Rider Weight, kg	RS:58
Dielectric voltage test value, V	150
Isolation resistance Voltage, Vdc	168Vdc

Sample No.	Initial OCV, Vdc	Final OCV, Vdc	Max Temp on Cell/Mod, °C	Length of shock, h	Test Condition	Results
SLine-1-2	83.2	83.2	--	--	C	N,O
SLine-2-3	83.3	83.3	--	--	A	N,O
	Dielectric Voltage Breakdown? Y or N		Measured Isolation Resistance, Ω			
SLine-1-2	N		--			
SLine-2-3	N		--			
Test Condition: Condition A: shock at 50 g, 11 ms; Condition B: shock at 25 g, 15 ms; Condition C: shock at 10 g, 20 ms;						

Results Key	
E – Explosion	L – Electrolyte Leakage (external to enclosure)
F - Fire	S – Electric shock (dielectric breakdown or resistance below isolation resistance limits
R – Rupture	N - No evidence of noncompliant results
O – Operational after test	

[ ] See also attached shock waveforms for details of shocks applied.

As a result of the shock, the samples ~~[did]~~ [did not] catch fire or explode during the test or at the conclusion of the rest period.

There ~~[was]~~ [was no] evidence of electrolyte leakage or signs or rupture of the battery enclosure.

CRUSH TEST UL 2272,35

METHOD

A fully charged DUT was subjected to a crush test as outlined below. One sample of the DUT was to be supported on a fixed rigid supporting surface, in the position and orientation that is representative of operation. A crushing force was applied to the foot support surface by two flat applicator plates each sized 102 by 254 mm (4 by 10 inches). A force of 2 times the maximum specified rider weight was evenly distributed between the two applicator plates to the scooter foot support surface. The total weight of the force applied to the foot support surfaces included the weight of the flat applicators.

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The test force was held in place for a minimum of one minute. The force was then removed. If the DUT was operational after the test, it was subjected to a minimum of one charge/discharge cycle at the manufacturer's maximum specified value. The DUT was then subjected to a 1 hour observation period.

The DUT with hazardous voltage circuits was subjected to a Dielectric Voltage Withstand Test or Isolation Resistance Test (without humidity conditioning). The sample was examined with the probe of 8.1.3 (2.5 mm diameter test rod) to determine if it is possible to access hazardous parts if applicable.

RESULTS

DUT:	RS
Test Date	2023-07-31
Test Ambient, °C	26.2
Max Specified Rider Weight , kg	150
Dielectric voltage test value, V	168Vdc
Isolation resistance voltage applied, Vdc	--

Sample No.	OCV at start, Vdc	Test Weight, kgs	Operational after crush, Y or N	Results
SLine-1-2	83.1	300kg	Y	N,O
	Dielectric Voltage Breakdown? Y or N	Measured Isolation Resistance, Ω		
SLine-1-2	N	--	--	
--	--	--	--	

Results Key	
E – Explosion	S – Electric shock (dielectric breakdown or resistance below isolation resistance limits or exposure of live parts)
F - Fire	N - No evidence of noncompliant results
L – Leakage	R – Rupture
	O – Operational after test

The sample **[**~~did~~**]** **[**did not**]** explode or catch fire. There **[**~~was~~**]** **[**was no**]** evidence of rupture or leakage.

[X] There **[**~~was~~**]** **[**was no**]** evidence of dielectric breakdown.

~~**[ ]** The insolation resistance **[**was**]** **[**was not**]** less than 50,000 Ω.~~

[X] There **[**~~was~~**]** **[**was no**]** exposure of hazardous parts.

Note:150kgX2 times =300kg

DROP TEST UL 2272,36

METHOD

A fully charged DUT was dropped three times from a height of 1.0 ± 0.01 m (39.4 ± 4 in) to strike a concrete surface in a manner most representative of what would occur during lifting or handling of the DUT by the user. The concrete surface was at least 75 mm (3 in) thick and was large enough in area to cover the DUT.

DUTs employing plastic enclosures were conditioned for a minimum of 3 h at 0°C (32°F) or temperature specified if lower than 0°C (32°F) prior to conducting the drop test, which was conducted immediately after removing the samples from the cold conditioning.

If the DUT was operational after the test, it was subjected to a discharge/charge cycle per the manufacturer's specified values. If the sample was not operational, it was still subjected to an attempted charge. The test was followed by a 1 hour observation period. The sample was then examined using the 2.5 mm test rod probe and the articulate probe for damage that could result in access to hazardous parts.

After examination, the DUT with hazardous voltage circuits was subjected to a dielectric voltage withstand test or isolation resistance test (without humidity conditioning).

ACCESSIBILITY PROBES:

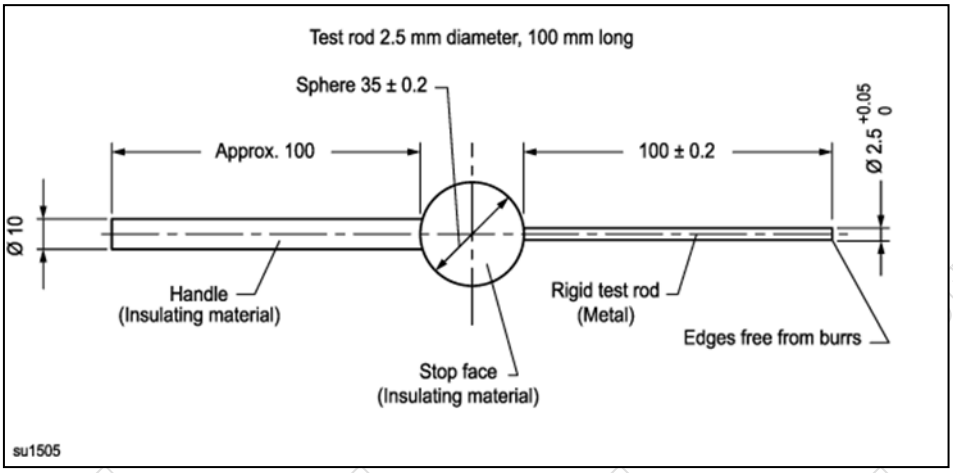


Figure - IEC 2.5 mm test rod

Note: The handle dimensions (ø 10 and 20) are not critical.

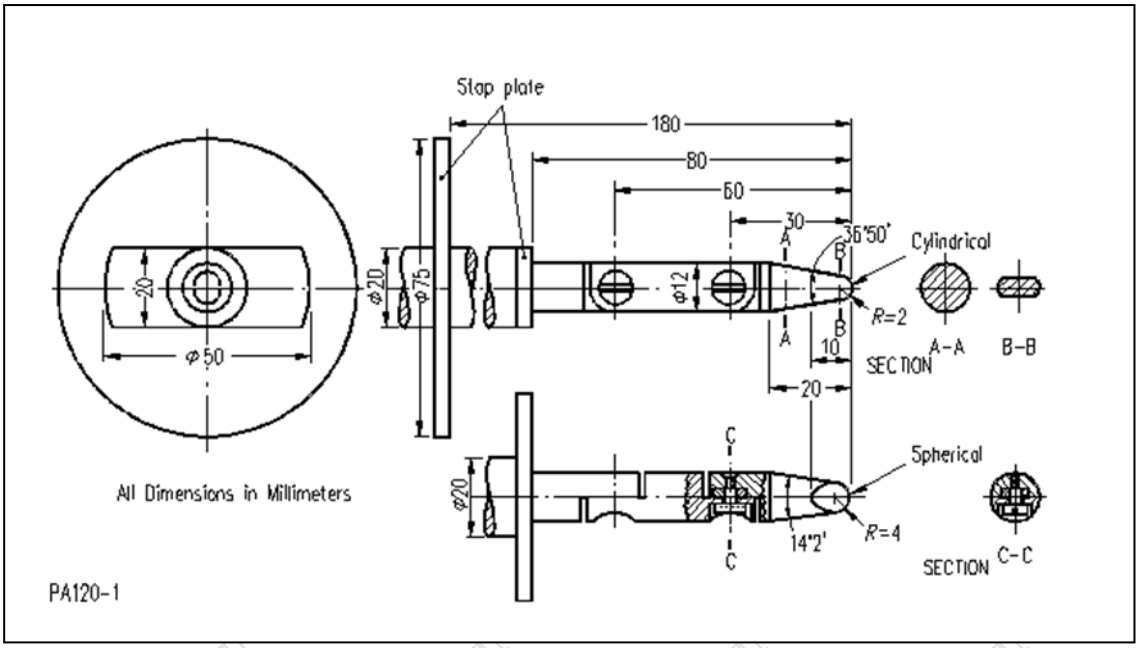


Figure - Articulate probe

RESULTS

DUT:	RS
Test Date:	2023-08-09
Test Ambient, °C	27.2
Dielectric voltage test value, V	168Vdc
Isolation resistance limit, Ω/ Ω/Vdc	N/A
Test Chamber Temperature, °C	-10

Sample No.	OCV at start of test, Vdc	Location of Drop	Accessibility Probe: [2.5 mm test rod]/ [articulate finger]	Results
SLine-1-2	83.3	Top	Failed to dangerous touch parts of the interior	N,O
SLine-1-2	--	Bottom	Failed to dangerous touch parts of the interior	N,O
SLine-1-2	83.2	Side	Failed to dangerous touch parts of the interior	N,O
	Dielectric Voltage Breakdown? Y or N	Measured Isolation Resistance, Ω		
SLine-1-2	N	--		--
--	--	--		--

Results Key	
E – Explosion	L – Electrolyte Leakage (external to enclosure)
F - Fire	S – Electric shock (dielectric breakdown or resistance below isolation resistance limits
R – Rupture	A – Hazardous parts accessible
O – Operational after testing	N - No evidence of noncompliant results

As a result of the drop impact, the DUT **[**~~did~~**]** **[**did not**]** catch on fire or explosion. There **[**~~was~~**]** **[**was no**]** evidence of leakage of electrolyte.

There **[**~~was~~**]** **[**was no**]** rupture of the enclosure that would result in access to hazardous parts.

[X] There ~~**[**was~~**]** **[**was no**]** evidence of dielectric breakdown.

~~**[ ]** The insolation resistance **[**was**]** **[**was not**]** less than 50,000 Ω.~~

MOLD STRESS RELIEF TEST UL 2272,37

METHOD

A sample was subjected to the mold stress test as in accordance with the method outlined in UL Subject 2271, Section 8.6.

A discharged battery DUT was placed in a full-draft circulating-air oven maintained at a uniform temperature of 70°C (158°F) or 10°C (18°F) plus the maximum temperature (T) measured on the polymeric enclosure materials during the temperature test of 26, whichever was the highest temperature.

The sample remained in the oven for 7 h.

After careful removal from the oven and return to room temperature, the DUT was examined for evidence of mechanical damage, such as cracking or warping of the enclosure or openings created that would allow access to hazardous parts using the 2.5 mm test rod probe and articulate probe as noted under GENERAL.

A DUT with hazardous voltage circuits was subjected to a dielectric voltage withstand test or an isolation resistance test (without humidity conditioning).

RESULTS

DUT:		RS	
Test Date		2023-08-08	
Maximum enclosure temperature measured in temperature test, °C		45.8	
Test Chamber Ambient, °C		70	
Lab Ambient, °C		26.5	
Isolation resistance limit, Ω/ Ω/Vdc		--	
Dielectric voltage test value, V		168Vdc	
Probe Used		[2.5 mm rod][articulate probe]	
Sample	Dielectric Voltage Breakdown? Y or N	Measured Isolation Resistance, Ω	Hazardous Part Accessible? Y or N
SLine-1-2	N	--	N

After careful removal from the oven and return to room temperature, the sample ~~[did]~~ **[**did not**]** show evidence of mechanical damage, such as cracking or warping of the enclosure or openings created that would allow access to cells and protection circuits with the test probes.

[X] There ~~[was]~~ **[**was no**]** evidence of dielectric breakdown.

~~**[ ]** The insolation resistance **[**was**]** **[**was no**]** less than 50,000 Ω.~~

Note: Plastic Enclosure maximum temperature (T)45.8℃+10=55.8℃, or 70℃, whichever was the highest temperature.

HANDLE LOADING TEST: UL 2272,38

METHOD

A force was applied on the handle in the intended carrying direction uniformly over a 75-mm (2.95-in) length at the center of the handle. The applied force was gradually increased from zero to four times the weight of the DUT in 5 - 10 s and then maintained at the level for 1 min.

If more than one handle was provided, the test force applied to each handle was based upon the percentage of the DUT weight sustained by each handle with the DUT in the intended carrying position. Each handle was then subjected to a weight of four times the determined weight for that handle.

If a DUT weighing less than 25 kg (55.1 lbs) was provided with more than one handle and could be carried by only one handle, each handle was subjected to a force based on the total weight of the DUT (for a total of four times the DUT.

RESULTS

DUT:	RS
Test Date	2023-08-07
Test Ambient, °C	27.2
DUT weight, kg	58
Number of handles provided on DUT	2

Sample	Weight Applied to Handle, kg		Results
SLine-1-2	No. 1	232	1
SLine-1-2	No. 2	232	1

Results Key	
1 – No damage to handle or handle securements means	2 – damage to handle or handle securement means

As a result of the applied force, there **[**~~was~~**]** **[**was no**]** evidence of damage to the handle(s) or the handle(s) securement means.

Test force: 58kgX4times=232kg

MOTOR OVERLOAD UL 2272,39

METHOD

[X**]** The motor was tested while in the scooter and temperatures on windings are to be monitored.

[ ] The motor was tested outside the scooter.

The motor was first operated under maximum normal load conditions. The load was then increased so that the current was increased in appropriate gradual steps with the motor supply voltage maintained at its original value. When steady state temperature conditions were established, the load was again increased. The load was thus progressively increased in appropriate steps until either the overload protection device operated or the motor winding became an open circuit.

[X**]** The motor winding temperatures were determined using thermocouples during each steady period and compared to determine that maximum temperatures did not exceed the value in Table 39.1.

Note: Motor overload test for normal motor test

[X**]** The design or size of the motor prevented the measuring of temperature windings. Instead of measuring temperatures the test was conducted with the motor removed from the scooter and supported on a surface covered with a single layer of tissue paper with the DUT covered with a single layer of cheesecloth.

Note: Motor overload test for abnormal motor test

If the DUT contained a hazardous voltage circuit, the DUT it was subjected to a Dielectric Voltage Withstand Test or Isolation Resistance Test (without humidity conditioning).

35.7 There shall be no insulation breakdown during the Dielectric Voltage Withstand Test or the isolation resistance shall not be below 50,000 Ω.

Table 39.1 – Motor Winding Temperature Limits during Overload

Thermal Class	Class A (105)	Class E (120)	Class B (130)	Class F (155)
Temperature Limit, °C	140	155	165	190

RESULTS

DUT:	RS
Test Date	2023-08-05
Test Ambient, °C	27.8
Insulation Class Temperature Limit, °C	140
Dielectric voltage test value, V	168Vdc
Isolation resistance voltage applied, Vdc	N/A

Sample No.	Test: In Scooter or on Bench	Location of Thermocouples	Maximum Temperature on Windings, °C	Ignition of combustibles? Y or N
SLine-1-1(Normal)	In Scooter, test with power supply and main control board	Motor winding	134.6	N/A
	Dielectric Voltage Breakdown? Y or N		Measured Insulation Resistance, Ω	
SLine-1-1	N		--	
--	--		--	

[X] Temperatures on windings ~~**[**did**]**~~ **[**did not**]** exceed the values noted in Table 39.1 for the class of insulation.

~~**[ ]** There **[**was**]** **[**was no**]** sign of ignition of the tissue or cheesecloth at the conclusion of the test.~~

[X] There ~~**[**was**]**~~ **[**was no**]** insulation breakdown during the Dielectric Voltage Withstand Test.

~~**[ ]** The isolation resistance **[**was**]** **[**was not**]** below the 50,000 ohms.~~

RESULTS

DUT:	RS
Test Date	2023-08-08
Test Ambient, °C	28.7
Insulation Class Temperature Limit, °C	--
Dielectric voltage test value, V	168Vdc
Isolation resistance voltage applied, Vdc	N/A
Abnormal Test	By-pass the over temperature protection

Sample No.	Test: In Scooter or on Bench	Location of Thermocouples	Maximum Temperature on Windings, °C	Ignition of combustibles? Y or N
SLine-1-1 (Abnormal)	In Scooter, test with power supply and main control board	Motor winding	196.3	N
	Dielectric Voltage Breakdown? Y or N		Measured Insulation Resistance, Ω	
SLine-1-1	N		--	
--	--		--	

[] ~~Temperatures on windings [did][did not] exceed the values noted in Table 39.1 for the class of insulation.~~

[X] There ~~[was]~~[was no] sign of ignition of the tissue or cheesecloth at the conclusion of the test.

[X] There ~~[was]~~[was no] insulation breakdown during the Dielectric Voltage Withstand Test.

[] ~~The isolation resistance [was][was not] below the 50,000 ohms.~~

MOTOR LOCKED ROTOR TEST UL 2272,40

METHOD

The motor was operated at the voltage used in its scooter application and with its rotor locked for 7 h or until steady conditions were established.

[X**]** The motor was tested while in the scooter and temperatures on windings were monitored. As an alternative, the motor was tested outside the scooter.

Note: Motor locked rotor test for normal motor test

[X**]** The test was conducted with the motor removed from the scooter and instead of monitoring temperatures, the DUT was supported on a surface covered with single layer of tissue paper with the DUT covered with a single layer of cheesecloth.

Note: Motor locked rotor test for abnormal motor test

[ ] The DUT shall be subjected to a Dielectric Voltage Withstand Test or Isolation Resistance Test (without humidity conditioning).

Table 40.1 – Motor Winding Temperature Limits during Locked Rotor

	Temperature Limits, °C			
Thermal Class	Class A (105)	Class E (120)	Class B (130)	Class F (155)
Type of Protection:				
Protection by inherent or external impedance	150	165	175	200
Protection by protective device that operates during the first hour	200	215	225	250

Protection by any protective device: • maximum after first hour (automatic) • maximum after first hour (thermal cutoff) • arithmetic average during the 2nd hour and during the 72nd hour	175 150 150	190 165 165	200 175 175	225 200 200

MOTOR LOCKED ROTOR TEST (CONT'D): UL 2272,40

RESULTS

DUT:	RS
Test Date	2023-08-07
Test Ambient, °C	26.3
Insulation Class Temperature Limit, °C	200
Type of Locked Rotor Protection:	Over Current protection
Dielectric voltage test value, V	168Vdc
Isolation resistance voltage applied, Vdc	N/A

Sample No.	Test: In Scooter or on Bench	Location of Thermocouples	Maximum Temperature on Windings, °C	Ignition of combustibles? Y or N
SLine-1-1 (Normal)	In Scooter, test with power supply and main control board	Winding	28.9	N/A
	Dielectric Voltage Breakdown? Y or N		Measured Isolation Resistance, Ω	
SLine-1-1	N		--	
--	--		--	

[X**]** Temperatures on windings **[**~~did~~**]** **[**did not**]** exceed the values noted in Table 40.1 for the class of insulation.

~~**[ ]** There **[**was**]** **[**was no**]** sign of ignition of the tissue or cheesecloth at the conclusion of the test.~~

[X**]** There **[**~~was~~**]** **[**was no**]** insulation breakdown during the Dielectric Voltage Withstand Test.

~~**[ ]** The isolation resistance **[**was**]** **[**was not**]** below the 50,000 ohms.~~

RESULTS

DUT:	RS
Test Date	2023-08-09
Test Ambient, °C	26.6
Insulation Class Temperature Limit, °C	--
Type of Locked Rotor Protection:	--
Dielectric voltage test value, V	168Vdc
Isolation resistance voltage applied, Vdc	N/A

Sample No.	Test: In Scooter or on Bench	Location of Thermocouples	Maximum Temperature on Windings, °C	Ignition of combustibles? Y or N
SLine-1-1 (Abnormal)	In Scooter, test with power supply and main control board	Winding	147.1	N
	Dielectric Voltage Breakdown? Y or N		Measured Isolation Resistance, Ω	
SLine-1-1	N		--	
--	--		--	

[X] Temperatures on windings ~~**[**did**]**~~ **[**did not**]** exceed the values noted in Table 40.1 for the class of insulation.

~~**[ ]** There **[**was**]** **[**was no**]** sign of ignition of the tissue or cheesecloth at the conclusion of the test.~~

[X] There ~~**[**was**]**~~ **[**was no**]** insulation breakdown during the Dielectric Voltage Withstand Test.

~~**[ ]** The isolation resistance **[**was**]** **[**was not**]** below the 50,000 ohm~~

WATER EXPOSURE TEST UL 2272,42

METHOD A

A fully charged DUT was subjected to a water exposure test in accordance with the *Standard for degrees of Protection Provided by Enclosures (IP Code)*,
IEC 60529.; for protection against water indicated by the second characteristic numeral **[**4 (IPX4)**]**

The DUT was not operated during the water exposure.

After the water exposure, the DUT was subjected to a minimum of one discharge/charge cycle at the manufacturer's maximum specified values as noted under GENERAL. Following the cycle, the DUT was subjected to a minimum 48 hour observation period.

After the observation period, DUTs with hazardous voltage circuits were subjected to a dielectric voltage withstand test or isolation resistance test (without humidity conditioning).

At the conclusion of Method A, the DUT was examined for signs of ingress of water that would result in a hazardous condition. In general, if any water had entered, it shall not:

- be sufficient to interfere with the correct operation of the DUT or impair safety;
- deposit on insulation parts where it could lead to tracking along the creepage distances;
- reach live parts or windings not designed to operate when wet.

The tests were conducted with fresh water. During the IP tests the water temperature did not differ by more than 5 K from the temperature of the specimen under test.

Note: During the test, dew which deposited on parts as a result of condensation was not considered evidence of ingress of water.

Table – Total Water Flow Rate Qv Under Ipx4 Test Conditions –
Mean Flow Rate Per Hole Qvl = 0.07 L/Min

Tube Radius ***R*** mm	Degree IPX4	
	Number of open holes N1)	Total water flow qv l/min

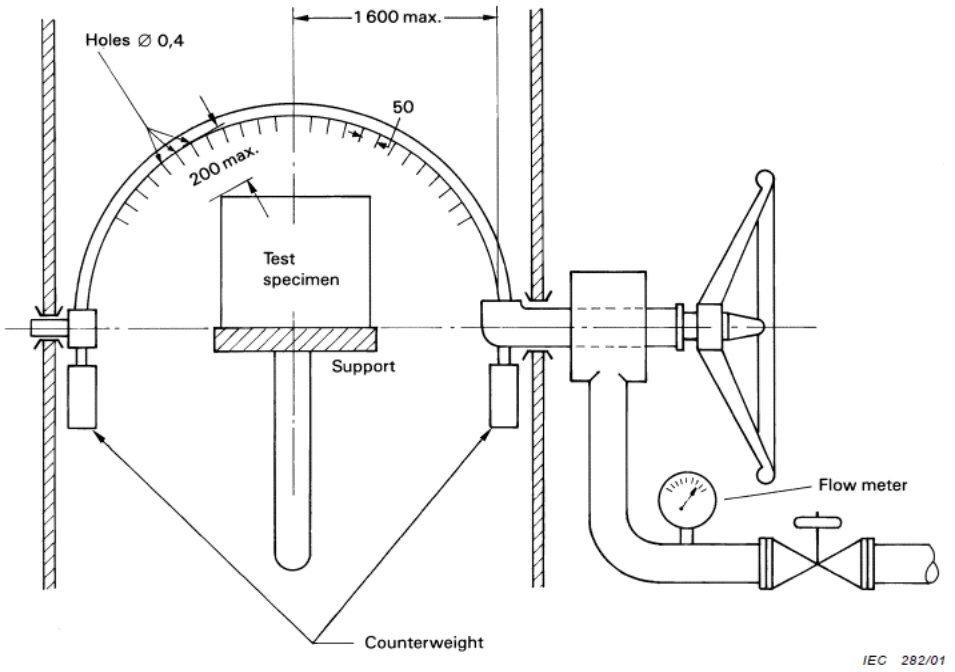
200	12	0.84
400	25	1.8
600	37	2.6
800	50	3.5
1000	62	4.3
1200	75	5.3
1400	87	6.1
1600	100	7.0
1) Depending on the actual arrangement of the hole centers at the specified distance, the number of open holes N may be increased by 1.		

The test was made using one of the two test devices described in figure 4 and in figure 5.

a) Conditions when using the test device of figure 4 (oscillating tube):

The oscillating tube had spray holes over the whole 180" of the semicircle. The total flow rate was adjusted as specified in the above table and was measured with a flow meter. The tube oscillated through an angle of almost 360°, 180° on either side of the vertical, the time for one complete oscillation (2 × 360°) was about 12 s. The duration of the test was 10 min. The support for the DUT was perforated to prevent it from acting as a baffle, and the DUT was sprayed from every direction by oscillating the tube to the limit of its travel in each direction.

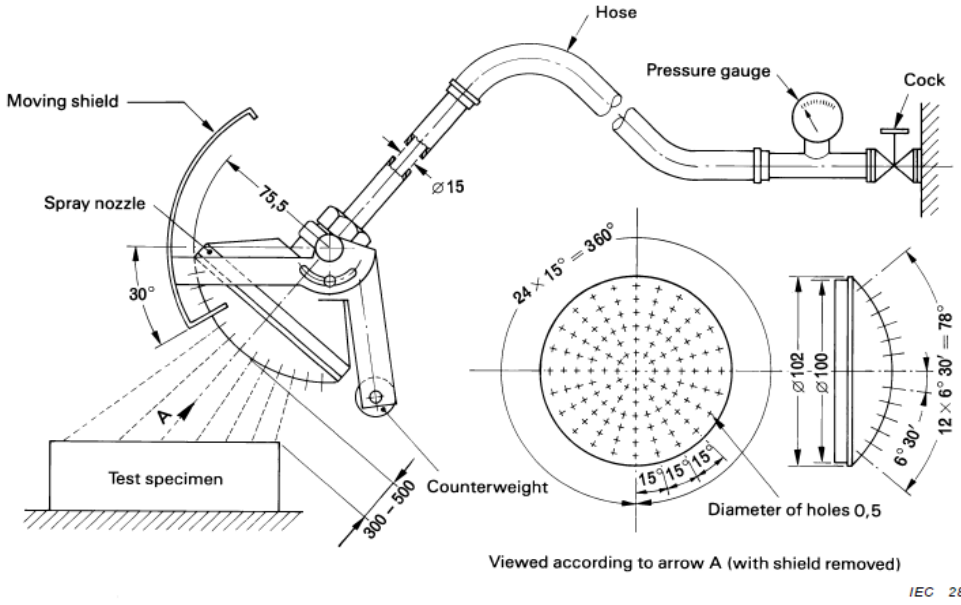
b) Conditions when using the test device as in figure 5 (spray nozzle): The counterbalanced shield was removed from the spray nozzle and the enclosure was sprayed from all practicable directions. The water pressure was adjusted to give the specified delivery rate. The pressure to achieve this delivery rate was in the range of 50 kPa to 150 kPa, which was kept constant during the test. The test duration was 1 min/m2 of the calculated surface area of the DUT enclosure (excluding any mounting surface), with a minimum duration of 5 min.



Dimensions in millimetres

NOTE The range of holes is shown as for second characteristic numeral 3 (see 14.2.3 a)).

Figure 4 – Test device to verify protection against spraying and splashing water; second characteristic numerals 3 and 4 (oscillating tube)



Dimensions in millimetres

121 holes of ∅ 0,5;
1 hole at the centre
1 inner circles of 12 holes at 30° pitch
4 outer circles of 24 holes at 15° pitch
Moving shield – Aluminium
Spray nozzle – Brass

Figure 5 – Hand-held device to verify protection against spraying and splashing water; second characteristic numerals 3 and 4 (spray nozzle)

RESULTS A

DUT	RS
IP Rating:	IPX4
Test Date	2023-08-10
Ambient Temperature, °C	27.2
Water Temperature, °C	26.6
Water Pressure, psi	65kpa
Test Device:	Spray Nozzle (Figure 5)
Tube Radius, mm	--
Water Flow Rate, l/min	--
Dielectric voltage test value, V	168Vdc
Isolation resistance voltage, Vdc	--

Sample No.	OCV at start before immersion, Vdc	OCV at conclusion of test, Vdc	Results
SLine-1-2	83.2	83.1	N,O
	Dielectric Voltage Breakdown? Y or N	Measured Isolation Resistance, Ω	
SLine-1-2	N	--	--

Results Key	
E – Explosion	L – Electrolyte Leakage (external to enclosure)
F - Fire	S – Electric shock (dielectric breakdown or resistance below isolation resistance limits
R – Rupture	O – Operational after testing
	N - No evidence of noncompliant results

As a result of the water exposure, the DUT **[**~~did~~**]** **[**did not**]** catch on fire or explosion. There ~~**[**was**]**~~ **[**was no**]** evidence of rupture or external leakage of electrolyte when subjected to cycling after the exposure. There ~~**[**was**]**~~ **[**was no**]** evidence of ingress of water into electrical compartments that could result in a hazard.

[X] There ~~**[**was**]**~~ **[**was no**]** evidence of dielectric breakdown

~~**[ ]** The insolation resistance **[**was**]** **[**was not**]** less than 50,000 Ω.~~

METHOD B

(Partial Immersion)

The DUT immersed in water up to its foot supporting surface while oriented in its operating position as specified by the manufacturer. The water used for the test was a salt water solution (5% by weight NaCl in H2O).

The duration of the immersion was 5 min. The DUT was removed from the water and was then subjected for a minimum 48 hour observation period. If the DUT was operational, it was subjected to one charge/discharge cycle. If the DUT was not operational, it was still subjected to an attempt to charge it. The DUT was then subjected to a 1 hour observation period.

After the observation period, DUTs with hazardous voltage circuits were subjected to a dielectric voltage withstand test or isolation resistance test (without humidity conditioning).

The DUT was then examined for signs of ingress of water that would result in a hazardous condition. In general, if any water had entered, it shall not:

- be sufficient to interfere with the correct operation of the DUT or impair safety;
- deposit on insulation parts where it could lead to tracking along the creepage distances;
- reach live parts or windings not designed to operate when wet.

If the DUT's enclosure was provided with drain-holes, the DUT was examined to determine that any water that entered did not accumulate but drained away without creating a hazardous condition as noted above.

Note: During the test, dew which deposited on parts as a result of condensation was not considered evidence of ingress of water.

RESULTS B

DUT	RS
Test Date	2023-08-10
Ambient Temperature, °C	27.2
Water Temperature, °C	26.5
Water Depth, mm	360
Dielectric voltage test value, V	168Vdc
Isolation resistance test voltage, Vdc	--

Sample No.	OCV at start before immersion, Vdc	OCV at conclusion of test, Vdc	Results
A5	83.4	0	W,N
	Dielectric Voltage Breakdown? Y or N	Measured Isolation Resistance, Ω	
--	--	--	--
--	--	--	--

Results Key	
E – Explosion	L – Electrolyte Leakage (external to enclosure)
F - Fire	S – Electric shock (dielectric breakdown or resistance below isolation resistance limits
R – Rupture	O – Operational after testing
W – Water Ingress	N - No evidence of noncompliant results

As a result of the water exposure, the DUT ~~[did]~~ [did not] catch on fire or explosion. There ~~[was]~~ [was no] evidence of rupture or electrolyte leakage.

~~Upon examination of the DUT, there [was] [was no] wetting of internal live parts that would result in a hazardous condition.~~

[X] There ~~[was]~~ [was no] evidence of dielectric breakdown.

~~[ ] The insolation resistance [was] [was not] less than 50,000 Ω.~~

THERMAL CYCLING TEST UL 2272,43

METHOD

A fully charged DUT was subjected to a thermal cycling test as noted below.

For the test, the DUT was placed in a chamber with ambient air cycling at the temperature extremes of either 60 ± 2°C or -20 ± 2°C. The transition period between exposure temperatures was 15 min or less.

Note: this test may be performed either through the use of a fast-response chamber, or by moving the DUT between two chambers at the two test temperatures.

The DUT remain at each extreme for as long as required for the DUT to reach a uniform temperature (±5 °C) of the chamber temperature but no less than 6 h.

A total of five cycles (at the high and low temperature extremes) were performed.

After the thermal cycling, the DUT was allowed to return to room ambient and then subjected to a discharge/charge cycle at the manufacturer's maximum specified values. If not operational, a charge was attempted. This was followed by an 1 h observation period as noted under GENERAL.

At the conclusion of the observation period, the DUT with hazardous voltage circuits was subjected to a dielectric voltage withstand test or isolation resistance test (without humidity conditioning).

The DUT was then examined for any signs of damage from the temperature conditioning that could result in a hazardous condition.

RESULTS

DUT:	RS	
Test Date:	2023-07-26 to 2023-07-29	
Ambient Temperature, °C	26.5/27.3/26.9/26.2	
Dielectric voltage test value, V	168Vdc	
Isolation resistance voltage, Vdc	--	
Test Temperatures, °C	Low:-20	High:60

	High Temperature Conditioning			Low Temperature Conditioning		
	Average Temp of Chamber, °C	Average Temp of Sample, °C	Duration at High Temp, h	Average Temp of Chamber, °C	Average Temp of Sample, °C	Duration at Low Temp, h
Model No.:						
Cycle 1	60.5	--	6.1	-20.5	--	6.1
Cycle 2	60.5	--	11.8	-20.3	--	6.1
Cycle 3	60.7	--	6.2	-20.7	--	11.7
Cycle 4	60.3	--	6.1	-20.5	--	6.1
Cycle 5	60.3	--	11.8	-20.4	--	6.1

Sample No.	Date/Time in chamber	Date/Time out of chamber	OCV at start, Vdc	OCV at end, Vdc	Results
SLine-1-1	2023-07-26 9:20	2023-07-29 15:55	83.2	82.8	N,O
	Dielectric Breakdown Y or N		Measured Isolation Resistance Ω		
SLine-1-1	N		--		--
--	--		--		--

Results Key	
E – Explosion	L – Electrolyte Leakage (external to enclosure)
F - Fire	S – Electric shock (dielectric breakdown or resistance below isolation resistance limits

R – Rupture	O – Operational after testing
	N - No evidence of noncompliant results

As a result of the thermal cycling, the DUT ~~[did]~~ [did not] catch on fire or explosion. There ~~[was]~~ [was no] evidence of electrolyte leakage or rupture of the enclosure.

[**X**] There ~~[was]~~[was no] dielectric breakdown

~~[ ] The isolation resistance [was][was not] less than 50,000 Ω.~~

OVERDISCHARGE TEST 26

METHOD

The fully charged DUT was subjected to a constant discharging current at the maximum discharging current specified by the manufacture under a single fault condition in the discharging circuit of the DUT that could lead to an overdischarge condition. Protective devices that had been determined reliable remained in the circuit. Cell voltages were measured to determine that they did not exceed specified end of discharge voltage limits. Temperatures were measured on a battery for monitoring purposes.

The test was continued until:

- the DUT was fully discharged to a near zero voltage state or
- protective devices remaining in the circuit operated, and the monitored temperatures return to ambient or steady state, or
- Explosion and/or fire occurred.

If the DUT was operational after the test, it was subjected to a minimum of one charge/discharge cycle at the manufacturer's maximum specified value. If not operational a charge was attempted. The test was followed by a one hour observation period.

At the conclusion of the observation period, a DUT with hazardous voltage circuits was subjected to an Isolation Resistance Test (without humidity conditioning) or a Dielectric Voltage Withstand Test.

OVERDISCHARGE TEST (CONT'D): 26

RESULTS

DUT	LR1726V/RS
Dielectric voltage test value, V	168Vdc
Isolation resistance limit, Ω/ Ω/Vdc	--
Lab Ambient, C	26.5/25.7

Sample No.	OCV at start of Test, Vdc	Fault Condition Imposed	Measured Maximum Discharge Current, A	OCV at end of Test, Vdc	Maximum Temp-erature, °C	Results
SLine-2-2	Normal	100	66.7	55.215	2.743	Y
SLine-1-1	Short Q59 Pin D-S	60.8	65.1	61.694	3.06	Y

Results Key	
E – Explosion	L – Electrolyte Leakage (external to enclosure)
F - Fire	S – Electric shock (dielectric breakdown or resistance below isolation resistance limits
C – Combustible Concentrations	P – Loss of protection controls
R – Rupture	N - No evidence of noncompliant results
O – Operational after testing	

As a result of the overdischarge test, the DUT ~~[did]~~ [did not] catch on fire or explode. There ~~[was]~~ [was no] rupture resultingin electrolyte leakage from the DUT enclosure or exposure of hazardous parts.

~~[] There [was][was no] evidence of combustible concentrations.~~

[**X**] There ~~[was]~~[was no] evidence of dielectric breakdown.

~~[] The isolation resistance measurements [were][were not] below acceptable values.~~

23

OVERCHARGE

METHOD

A fully charged DUT was discharged at a 0.2C constant discharge rate or higher discharge rate permitted by the manufacturer to the manufacturer's specified EODV.

The DUT was then subjected to a constant current charging at the manufacturer's maximum specified charging rate and under a single fault condition in the circuitry that directly controls the charging line of the DUT that could lead to an overcharge conditions. Protective devices determined reliable in accordance with 18.5 of UL 2271/ULC S2271 were allowed to remain in the circuit.

For information purposes, temperatures were monitored on the cell/module where temperatures may be highest.

The test was continued until the voltage had reached 110% of the maximum specified voltage limit and monitored temperatures returned to ambient or steady state conditions and an additional 2 hours had elapsed, or explosion /fire occurred.

If the DUT was operational after the tests, it was subjected to a minimum of one charge/discharge cycle at the manufacturer's maximum specified values as noted under GENERAL. The test was followed by an observation period as noted under GENERAL.

At the conclusion of the observation period, the samples with hazardous voltage circuits were subjected to a dielectric voltage withstand test or isolation resistance test (without humidity conditioning).

If a protective device in the circuit operated, the test was repeated at 90% of the trip point of the protection device or at some percentage of the trip point that allows charging for at least 10 minutes.

OVERCHARGE (CONT'D): 23

RESULTS

DUT	LR1726V
Dielectric voltage test value, V	168Vdc
Isolation resistance limit, Ω/ Ω/Vdc	--
Maximum Specified Charging Current, Ic	10A
Maximum Specified Charging Voltage, Vc	83.8Vdc
110% of Maximum Specified Charging Voltage, Vc	92.18V
Lab Ambient, C	26.1/26.8

Sample No.	OCV at start of Test, Vdc	Fault Condition Imposed	Measured Maximum Charge Current, A	Measured Max Charge Voltage, Vdc	Maximum Temp-erature, °C	Results
SLine-2-2	First	Short Q66 Pin D-S	29.4	83.908	4.2	Y
SLine-2-2	First	Short Q65 Pin D-S	29.6	85.984	4.302	Y

Voltage measure location (see illustration in temperature test)	Measured Max cell voltage during non-fault condition, Vdc	Specified upper limit charging voltage, Vdc
Fault: Short Q66 Pin D-S		
Cell No. 1	4.195	4.325
Cell No. 2	4.198	4.325
Cell No. 3	4.198	4.325
Cell No. 4	4.200	4.325
Cell No. 5	4.195	4.325
Cell No. 6	4.199	4.325
Cell No. 7	4.198	4.325
Cell No. 8	4.196	4.325
Cell No. 9	4.192	4.325
Cell No. 10	4.195	4.325
Cell No. 11	4.195	4.325
Cell No. 12	4.195	4.325
Cell No. 13	4.195	4.325
Cell No. 14	4.192	4.325
Cell No. 15	4.191	4.325
Cell No. 16	4.196	4.325
Cell No. 17	4.194	4.325
Cell No. 18	4.193	4.325
Cell No. 19	4.196	4.325
Cell No. 20	4.195	4.325

Voltage measure location (see illustration in temperature test)	Measured Max cell voltage during non-fault condition, Vdc	Specified upper limit charging voltage, Vdc
Fault: Short Q65 Pin D-S		
Cell No. 1	4.302	4.325
Cell No. 2	4.300	4.325
Cell No. 3	4.300	4.325
Cell No. 4	4.299	4.325
Cell No. 5	4.297	4.325
Cell No. 6	4.300	4.325
Cell No. 7	4.301	4.325
Cell No. 8	4.299	4.325
Cell No. 9	4.298	4.325
Cell No. 10	4.300	4.325
Cell No. 11	4.298	4.325
Cell No. 12	4.299	4.325
Cell No. 13	4.297	4.325
Cell No. 14	4.297	4.325
Cell No. 15	4.298	4.325
Cell No. 16	4.299	4.325
Cell No. 17	4.299	4.325
Cell No. 18	4.297	4.325
Cell No. 19	4.302	4.325
Cell No. 20	4.302	4.325

Results Key	
E – Explosion	L – Electrolyte Leakage (external to enclosure)
F - Fire	S – Electric shock (dielectric breakdown or resistance below isolation resistance limits
C – Combustible Concentrations	P – Loss of protection controls
R – Rupture	N - No evidence of noncompliant results

As a result of the overcharge test, the DUTs ~~[did]~~ [did not] catch on fire or explode. There ~~[was]~~ [was no] rupture resultingin electrolyte leakage from the DUT enclosure or exposure of hazardous parts.

~~[] There [was][was no] evidence of combustible concentrations.~~

[**X**] There ~~[was]~~[was no] evidence of dielectric breakdown.

~~[] The isolation resistance measurements [were][were not] below acceptable values.~~

27

IMBALANCED CHARGING TEST

METHOD

A fully charged DUT was discharged down to its EODV with the exception of one cell/cell block. The one cell/cell block was discharged to approximately 50% of its SOC to create an imbalanced condition in the DUT.

The imbalanced DUT was then charged in accordance with the manufacturer's specifications. The voltage of the partially charged cell/cell block was monitored during charging to determine if its voltage limits were exceeded.

If the DUT was operational after the tests, it was subjected to a minimum of one charge/discharge cycle at the manufacturers' maximum specified values as noted under GENERAL. The DUT was then subjected to an observation period as noted under GENERAL.

At the conclusion of the observation period, the DUT with hazardous voltage circuits was subjected to an isolation resistance test (without humidity conditioning) or a dielectric voltage withstand test.

IMBALANCED CHARGING Test (CONT'd): 27

RESULTS

DUT:	LR1726V
Lab Ambient, °C	26.1/25.4
Dielectric voltage test value, V	168Vdc
Isolation resistance limit, Ω/ Ω/Vdc	--

Sample No	OCV of pack after charging, Vdc	Maximum voltage of monitored cell(s), V	Maximum current of monitored cell(s),A	Max Temp on monitored cells, °C	Results
SLine-2-1	--	3.595	4.198	Short Q66 Pin D-S	28.3
SLine-2-1	--	3.590	4.3	Short Q65 Pin D-S	29.8

Results Key	
E – Explosion	L – Electrolyte Leakage (external to enclosure)
F - Fire	S – Electric shock (dielectric breakdown or resistance below isolation resistance limits
C – Combustible Concentrations	P – Loss of protection controls
R – Rupture	N - No evidence of noncompliant results
O – Operational after testing	

The DUT ~~[did]~~ [did not] catch on fire or explode. There ~~[was]~~ [was no] venting orrupture resulting in electrolyte leakage from the DUT enclosure or exposure of hazardous parts.

The maximum voltage limit of the monitored cell/cell block ~~[was]~~ [was not] exceeded when subjected to maximum normal charging conditions.

~~[] There [was][was no] evidence of combustible concentrations.~~

[X] There ~~[was]~~[was no] evidence of dielectric breakdown.

~~[] The isolation resistance measurements [were][were not] below acceptable values~~

SHORT CIRCUIT TEST (CONT'D): UL 2580 – ULC 2580, B2.7

METHOD (CONT'D)

C) CID – if a CID operates during the test, the testing was repeated on the remaining samples as follows:

1. The test was conducted as a full short circuit test for all samples, with no repeat testing at loads below a protector trip point level.

D) Fusible Tabs/Connections – If a fusible tab or connector operated during the test, the testing was repeated on the remaining samples as follows:

1. The test was conducted as a full short circuit test for all samples, with no repeat testing at loads below a protector trip point level.

E) Fuse – If a fuse operated during the test, the testing was repeated on the remaining samples with the discharge load set to just below the trip point level (operating parameters) of the fuse.

Placement of Samples:

Samples shall not be placed on a conductive surface and shall not be touching during the test.

Note to Technician:
Safety Information - See safety information at beginning of data package prior to testing including information regarding testing of larger cells. Samples are not to be handled until they have reached safe temperatures (example ± 10°C from ambient).

SHORT CIRCUIT TEST (CONT'D): UL 2580 – ULC 2580, B2.7

RESULTS

Model	INR21700-50E++
Room Ambient, °C	22.4
Oven Temperature, °C	25.2
Maximum Charge Current, A	4.9
Maximum Charge Voltage, V	4.325

[ ] The following protective device was shorted prior to testing:

[ ] large cell, should be isolated when tested.

Note: Use load cell to determine the maximum trip and no-trip values.

Sample No.	Cell Condition	Initial OCV, Vdc	Total Load Resistance of Circuit, mΩ (#)	Maximum Short Circuit Current, A	Maximum Temperature of Cell Case, °C	Results Evidence of: [N][F][E][R]
SLine-4-5	4.31	0	4.5	136.6	--	N
SLine-4-7	4.302	0	4.5	123.0	--	N
SLine-8-8	4.3	0	4.5	127.6	--	N

- Must be ≤ 20 mOhms.

Results Key:

N – No evidence of fire, explosion or rupture

F – Evidence of fire

E – Evidence of explosion

R – Evidence of rupture

As a result of the test, there ~~[was]~~[was no] evidence of rupture, fire, or explosion of the cells.

OVERCHARGE TEST: **UL 2580 – ULC 2580, B2.8**

METHOD

The overcharge test was performed as follows:

a) The SOC of cell was adjusted to 100 % in accordance with the SOC ADJUSTMENT method noted above.

b) The cell was then continued to be charged beyond the 100 % SOC with a maximum specified charging current of __ A, at room temperature using a power supply sufficient to provide the constant charging current.

The overcharge test was discontinued when the voltage of cell reached 120 % of maximum specified charge voltage, or the quantity of electricity applied to the cell reached the equivalent of 130 % SOC, whichever came first.

Note to Technician: Safety Information - See safety information at beginning of data package prior to testing including information regarding testing of larger cells. Samples are not to be handled until they have reached safe temperatures (example ± 10°C from ambient).

OVERCHARGE TEST (CONT'D): UL 2580 – ULC 2580, B2.8

RESULTS

Model	INR21700-50E++
Room Ambient, °C	23.4
Maximum Charge Current, A	4.9
Maximum Charge Voltage, V	4.325
0.2 C Discharge Current, A	0.98
End of Discharge Voltage (EODV), V	2.5
Rated Capacity, Ah	4.9
120% of Maximum Charge Voltage, V	6.228
130% of SOC, Ah	6.37

[] large cell, should be isolated when tested.

Sample No	Initial OCV, V	Charge Current, A	End OCV, V	Charging Time to overcharge, hh:mm (#)	Maximum Temperature of Cell Case, °C	Results Evidence of: [N][F][E][R]
SLine-4-4	4.31	4.87	0.3	30.2	4.9	N
SLine-4-6	4.305	4.875	0.3	29.8	4.9	N
SLine-4-9	4.301	4.882	0.3	30.0	4.9	N

– Time is measured when charging beyond 100% SOC.

Results Key:

N – No evidence of fire, explosion or rupture

F – Evidence of fire

E – Evidence of explosion

R – Evidence of rupture

As a result of the test, there ~~[was]~~[was no] evidence of rupture, fire, or explosion of the cells

HEATING TEST: **UL 2580 – ULC 2580, B2.5**

METHOD

The test was performed as follows:

a) The SOC of cell was adjusted to 100 % for BEV application, and to 80 % for HEV application in accordance with SOC ADJUSTMENT method noted above.

b) The cell, stabilized at room temperature in accordance with the TEMPERATURE STABILIZATION method noted above, was placed in a gravity or circulating air-convection oven. The oven temperature was raised at a rate of 5 °C/min to a temperature of 130 °C ± 2 °C. The cell remained at this temperature for 30 min before the test was discontinued.

NOTE: If necessary, to prevent deformation, the cell may be maintained during the test in a manner that does not violate the test purpose.

Note to Technician: Safety Information - See safety information at beginning of data package prior to testing including information regarding testing of larger cells. Samples are not to be handled until they have reached safe temperatures (example ± 10℃ from ambient).

HEATING TEST (CONT'D): UL 2580 – ULC 2580, B2.5

RESULTS

Model	INR21700-50E++
Room Ambient, °C	24.9
Maximum Charge Current, A	4.9
Maximum Charge Voltage, V	4.325
Target Oven Temperature, °C	130
Time at Target Oven Temperature	[10 min]~~[30 min]~~

Sample No.	Initial OCV, V	Comments Evidence of: [N][F][E][R]
SLine-4-1	4.31	N
SLine-4-2	4.30	N
SLine-4-3	4.31	N

Results Key:

N – No evidence of fire, explosion or rupture

F – Evidence of fire

E – Evidence of explosion

R – Evidence of rupture

As a result of the test, there [was][was no] evidence of fire, explosion, or rupture of the cells.

PROJECTILE TEST: **UL 2580 – ULC 2580, B2.10**

METHOD

The test was conducted at room temperature 25 ± 5ºC.

Each sample was charged at the maximum charging rate specified by the manufacturer until fully charged. The temperature was then be allowed to stabilize at room ambient.

Each sample was placed on a screen that covers a 102 mm (4 in) diameter hole in the center of a platform table. The screen was constructed of steel wire mesh having 20 openings per 25.4 mm (1 in) and a wire diameter of 0.43 mm (0.017 in).

The screen was mounted 38 mm (1-1/2 in) above a Meker type burner. The fuel and airflow ratio were set to provide a bright blue flame that caused the supporting screen to glow a bright red.

An eight-sided covered wire cage made from metal screening, with dimensions noted below, was placed over the test sample:

- **[**610 mm (2 ft)**]** / **[** _mm**]** across; and
- **[**305 mm (1 ft)**]** / **[**_____mm**]** high.

The size of the wire test cage was allowed to be adjusted from the original 610 mm by 305 mm standard dimensions for larger cells so that it measured about 305 mm (1 ft) from the edges of the cell under test.

The metal screening of the wire cage was constructed from a single layer of 0.25 mm (0.010 in) diameter aluminum wire with 16 to 18 wires per 25.4 mm (1 in) in each direction. The aluminum screening was free from holes and secured tautly around the test cage frame.

[ ] The test cage was replaced by a visible circular perimeter marking on the supporting surface located 0.5 m (19.7 in) from the longest side of the cell. The marking was no greater than 5-mm (0.2-in) thick. The test set-up was located within a protective enclosure/room with noncombustible surfaces located a distance from the test perimeter marking where any projectiles that fall beyond the test perimeter marking were safely contained.

PROJECTILE TEST (CONT'D): UL 2580 – ULC 2580, B2.10

METHOD (CONT'D)

The sample was heated and remained on the screen until it exploded was ignited and burned out. The sample was not required to be secured in place unless it was at risk of falling off the screen before ultimate results were obtained. If required, the sample was secured to the screen with a single wire tied around the sample.

Note to Technician: The securement wire is only utilized if the sample will not remain above the flame during the test to achieve ultimate results.
In this case the single wire utilized should be the minimal thickness necessary to hold the battery in place.

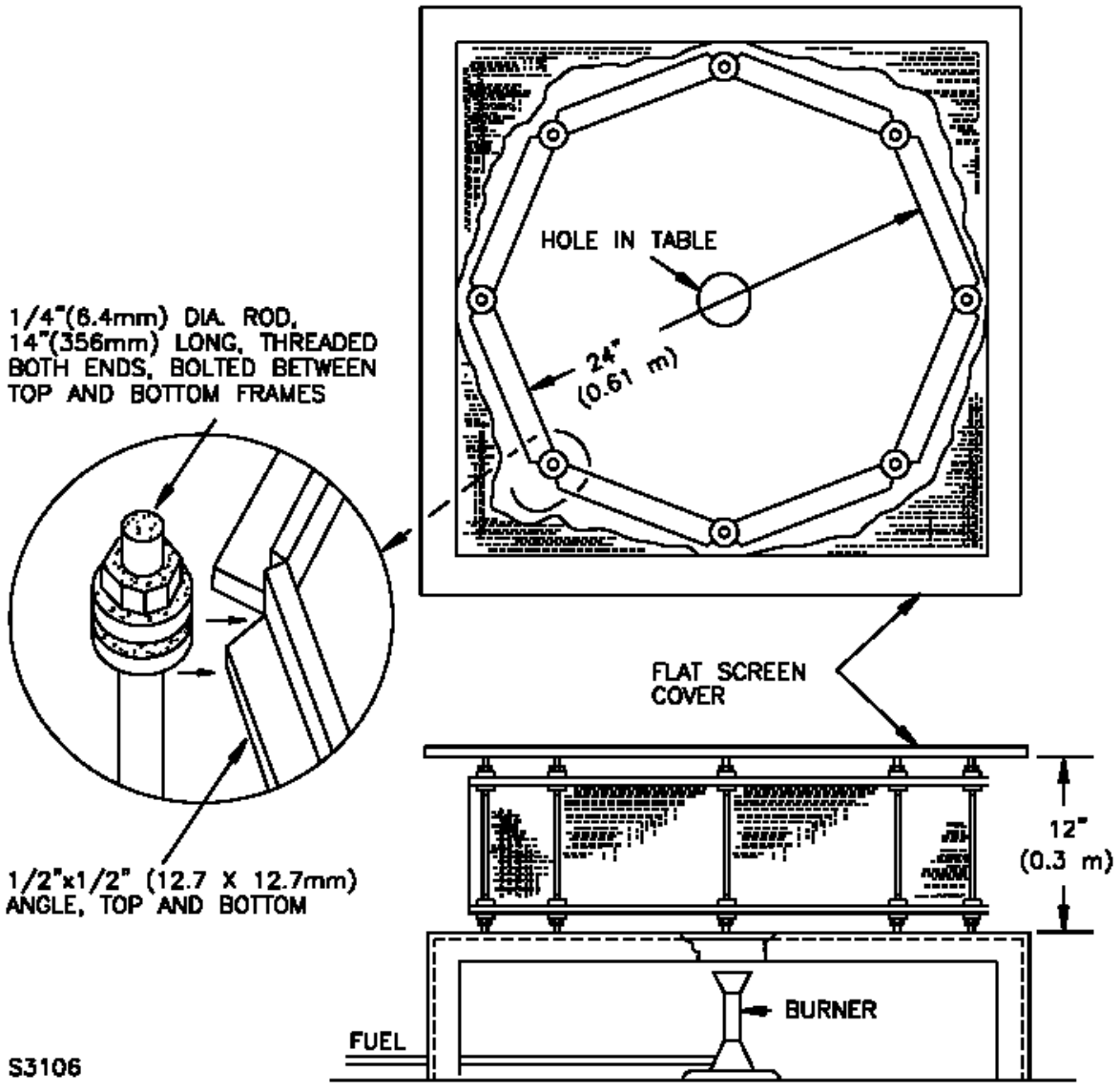
If one of the first set of samples penetrated the screen, a second set of samples was allowed to be tested.

Note to Technician: Safety Information - See safety information at beginning of data package prior to testing including information regarding testing of larger cells. Samples are not to be handled until they have reached safe temperatures (example ± 10°C from ambient).

PROJECTILE TEST (CONT'D): UL 2580 – ULC 2580, B2.10

METHOD (CONT'D)

Test apparatus for projectile test



PROJECTILE TEST (CONT'D): UL 2580 – ULC 2580, B2.10

RESULTS

Model	INR21700-50E++
Room Ambient, °C	22.5
Maximum Charge Current, A	4.9
Maximum Charge Voltage, V	4.325

Sample No.	Initial OCV, V	Comments
SLine-4-11	4.302	2
SLine-4-12	4.305	2
SLine-4-10	4.310	2

Comments Key

(1) Cell did not explode.

(2) Cell exploded but no part of the cell casing penetrated the wire screen.

(3) Cell exploded such that particles from the casing penetrated the wire screen.

(4) Cell vented without exploding.

(5) Other.

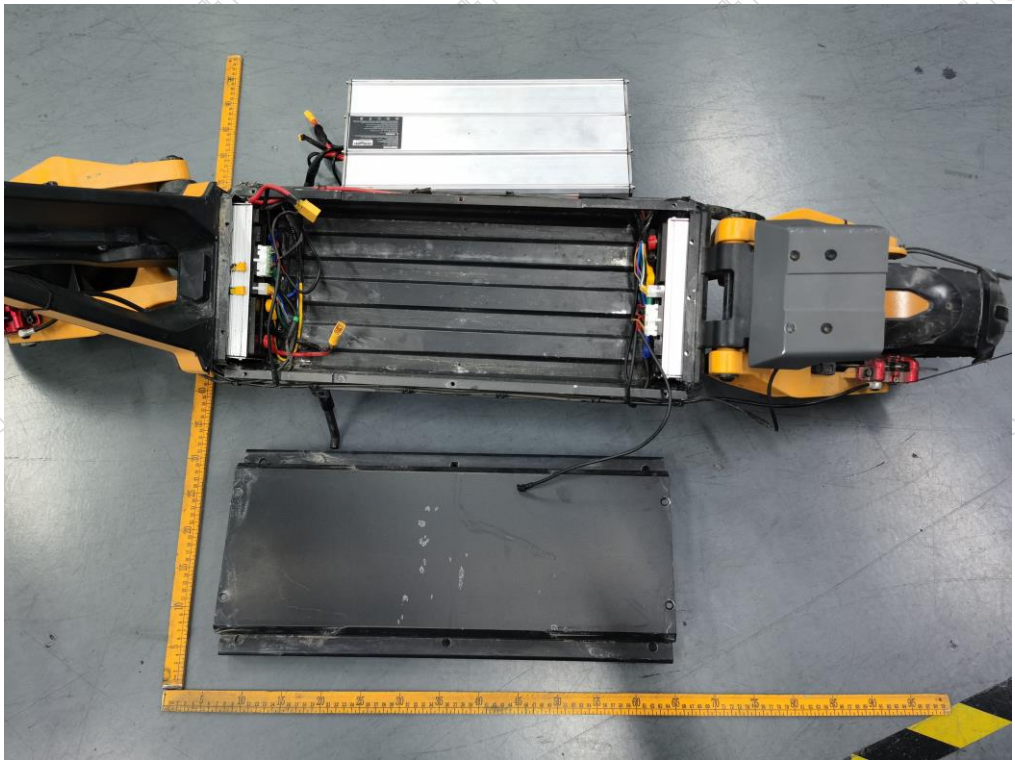
The results [were]~~[were not]~~ in compliance.

Enclosures

Supplement Id	Description
01	Overall View
02	Internal View
03	Overall View for Motor
04	Overall View for main board
05-1, 05-2	Main board view
06	Overall view for battery pack
07	Specification
08	Critical components information
09	Schematics for main board
10	PCB Layout for main board
11	Drawing
12	Drawing for Motor
13	Marking Label

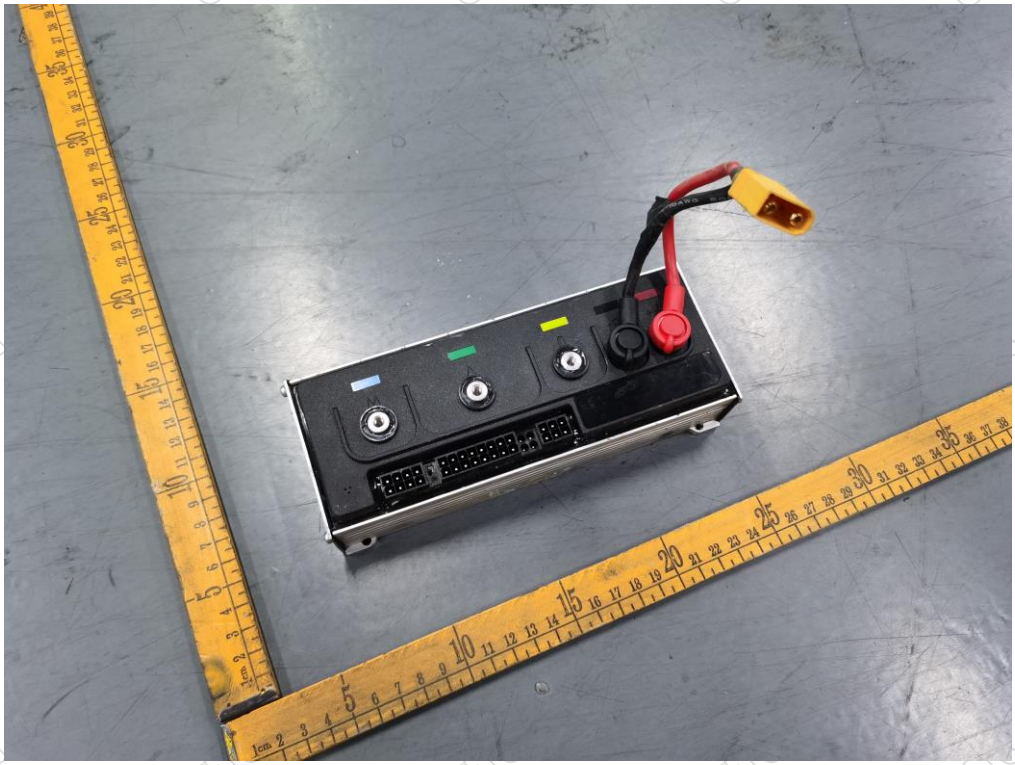
ID 01

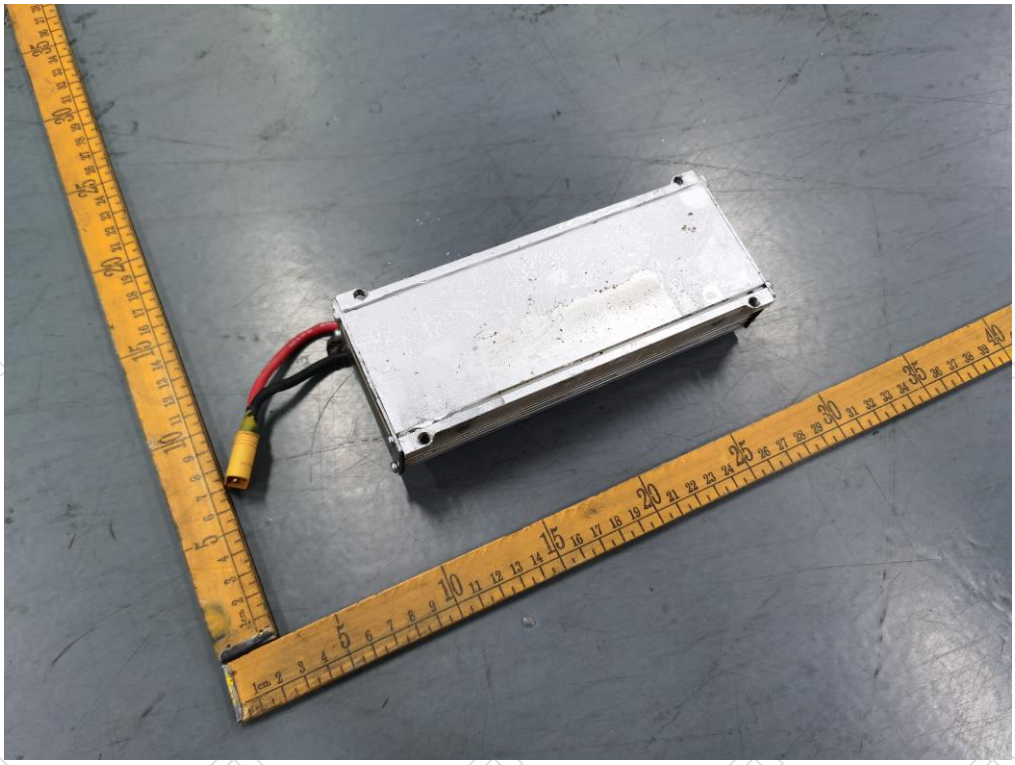
ID 02



ID 03

ID 04-1





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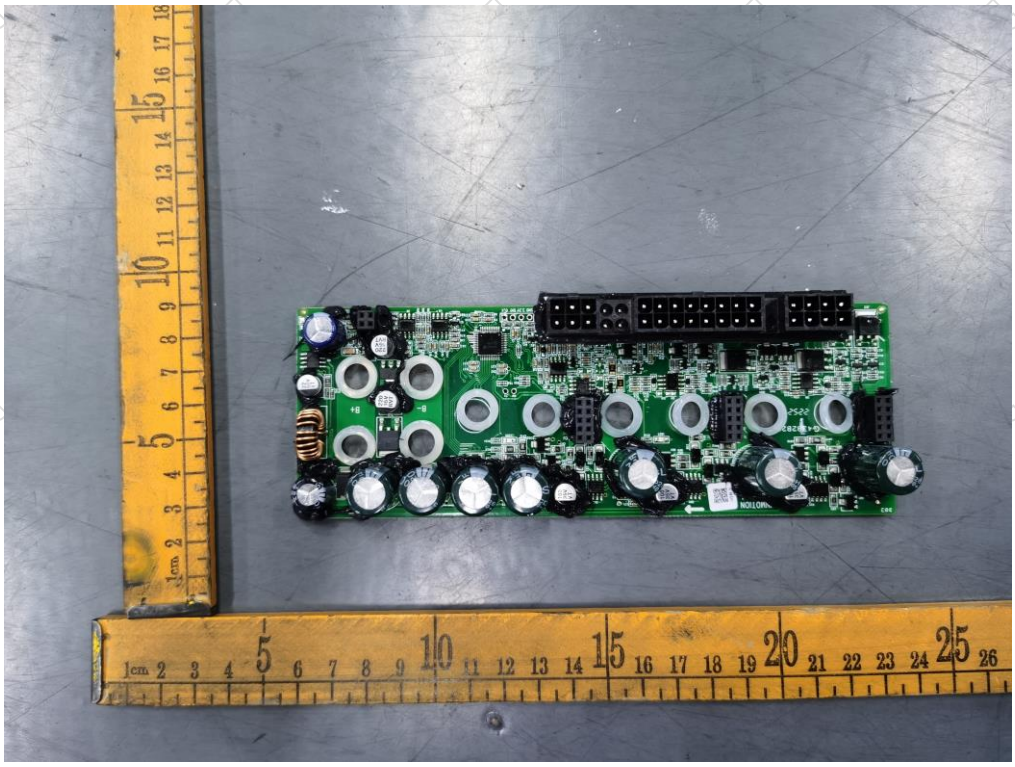
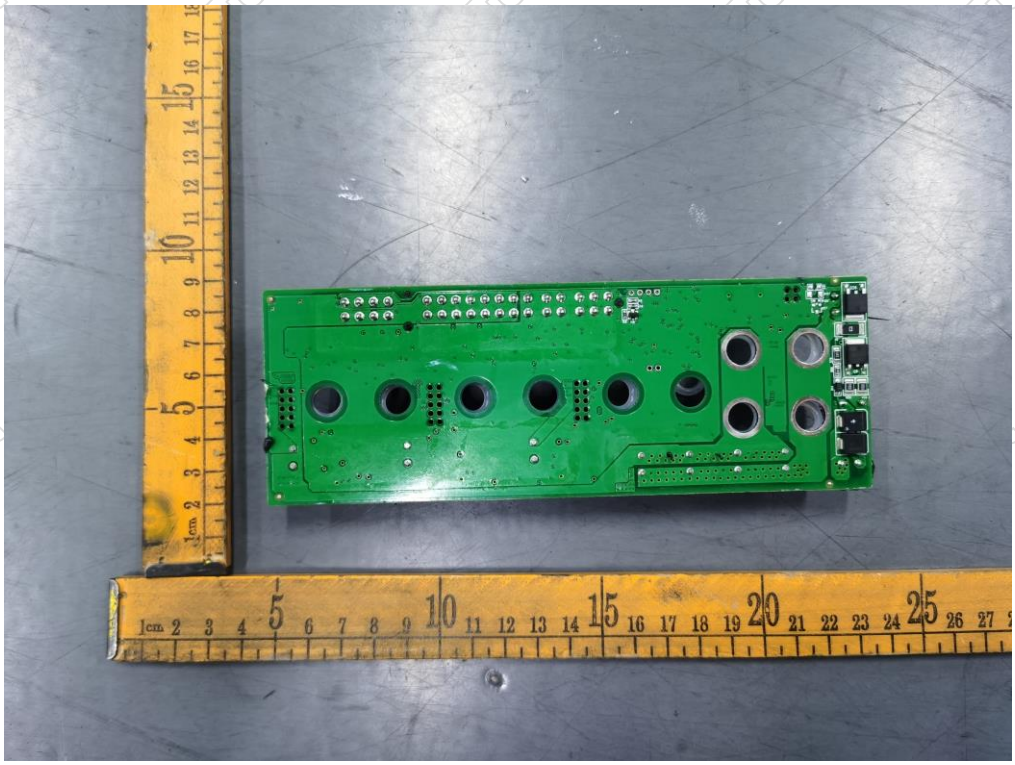
ID 05-1





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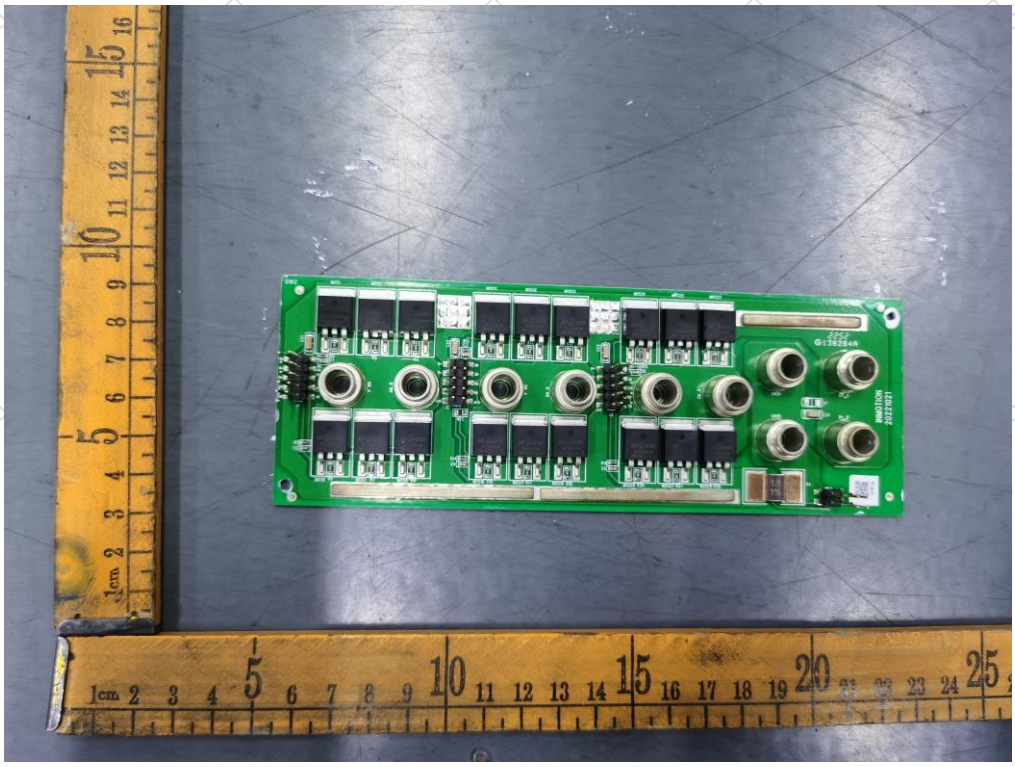

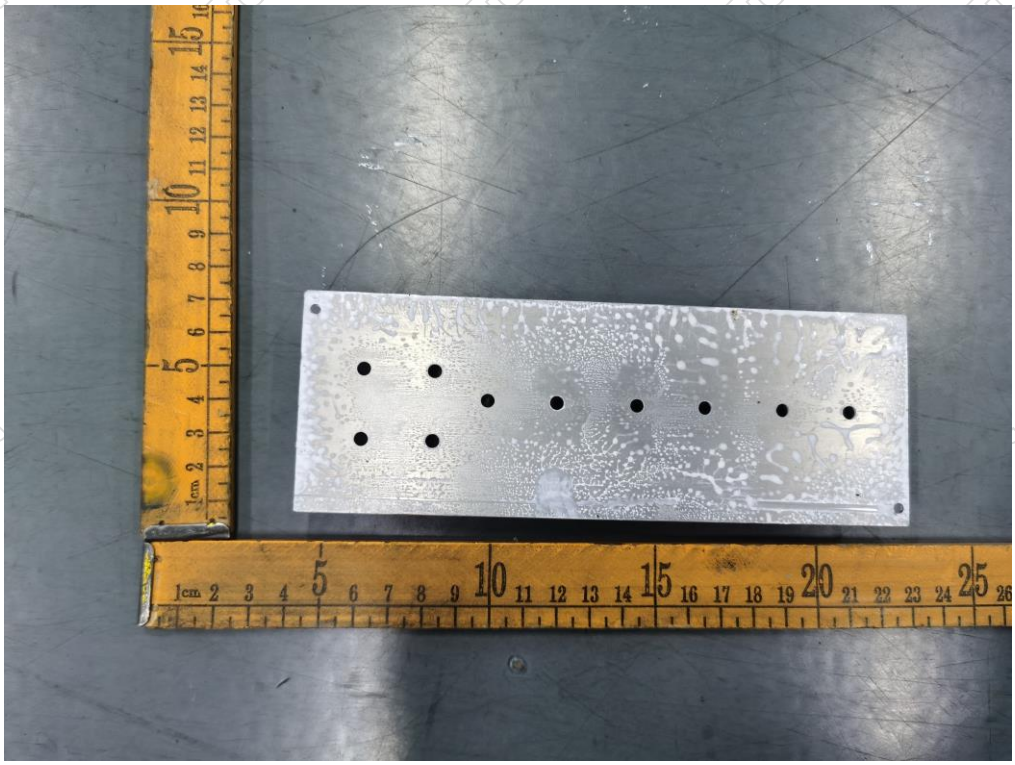

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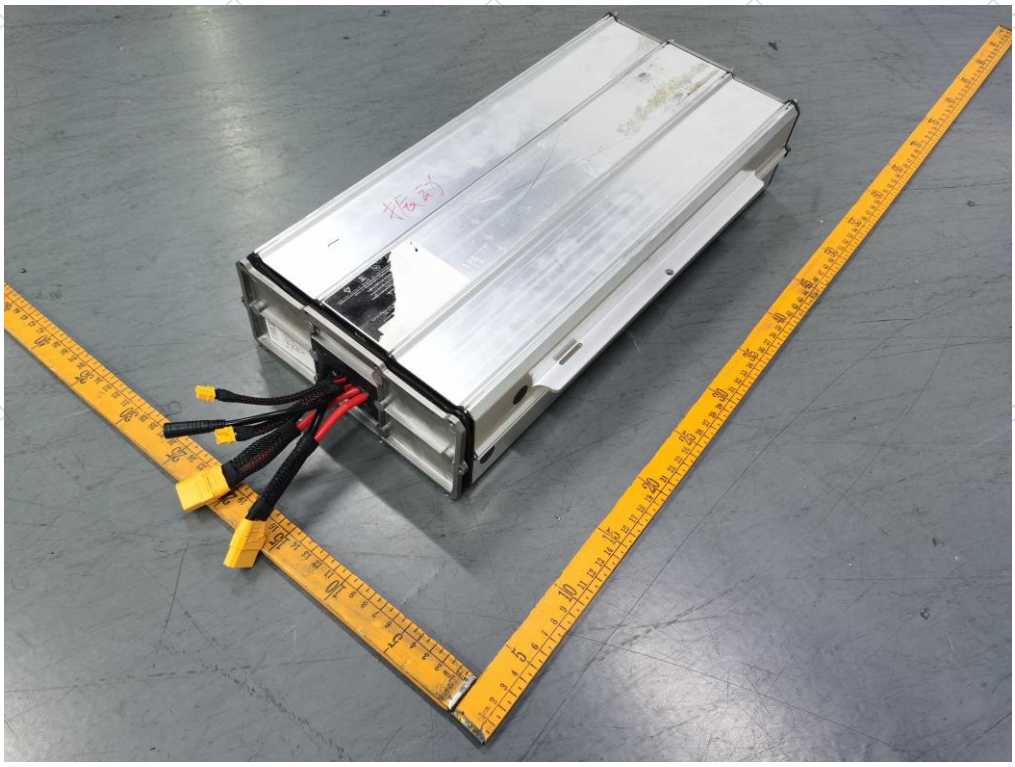

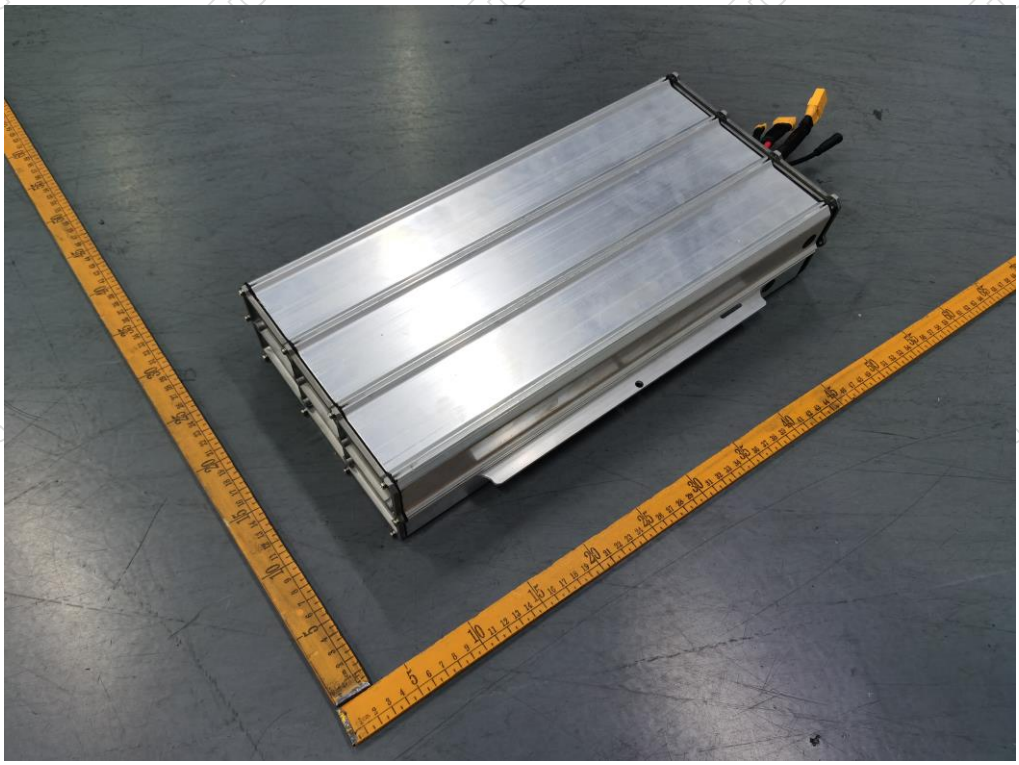

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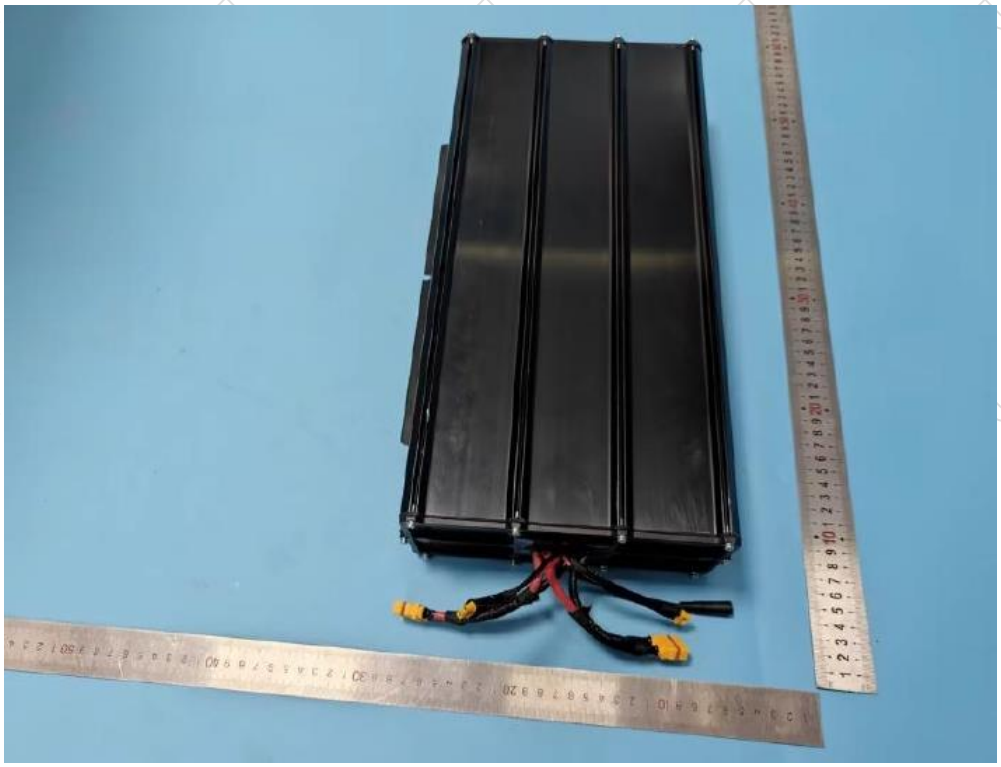


ID 07

COMPONENT CELL:		BATTERY :	
Manufacturer	Samsung SDI Co Ltd	Manufacturer	HUIZHOU BLUEWAY ELECTRONICS CO., LTD.
Model	INR21700-50E++	Model	LR1726V
Type	Li-ion	Configuration: XP/YS	20S8P
Capacity	4900mAh	Capacity	39.2Ah
Voltage Rating	3.63V	Voltage Rating	72.6V
Standard Charging Current	2.45A	Standard Charging Current	10.0A
Standard Full Charging Voltage	4.2V	Standard Full Charging Voltage	83.8V
End of Charging Current	98mA	End of Charging Current	100mA
Maximum Charging Current	4.9A	Maximum Charging Current	10A
Upper Charging Voltage Limit	4.325V	Maximum Charging Voltage	83.8V
Standard Discharging Current	4.9A	Standard Discharging Current	7.84A
Discharge End Point Voltage	2.5V	Discharge End Point Voltage	55.0V
Maximum Discharge Current	9.8A	Maximum Discharge Current	100A
Charging Temperature Range	0-45℃	Charging Temperature Range	0-45
Discharging Temperature Range	-20-60℃	Discharging Temperature Range	-20-60
Upper Limit of Cell surface Temperature, °C	60℃ for charge and 70℃ for discharge	Overcharge Voltage Protection	--

CHARGER:		PERSONAL E-MOBILITY DEVICE:	
Model No.	AP-PF600CH08360050	Type of Device	--
Manufacturer	Shenzhen Shi Alrightpower Technology Co Ltd	Model No.	RS
Input Voltage Rating	100-240Vac, 50/60Hz	Manufacturer	INMOTION TECHNOLOGIES CO., LTD
Output Voltage Rating:	83.8V Max.	Electrical Ratings (volts, current and/or power)	84Vdc, 40Ah
Input Current Rating	8.00A Max.	Weight of device, lbs/kg	58kg
Output Current Rating	5±5%	Max Weight Limit, kg	150kg
MOTORS:		Max Speed, mph	110km/h
Model No.	RS Motor	IP rating	IPX4
Manufacturer	Jinyuxing Electromechanical Technology (Zhejiang) Co., Ltd	Specified maximum angle of operation	26
Motor Type	DC	Provided with Handle (s)	--
Insulation Class	CLASS A	Specified operating ambient range, C	-10~40℃
Specified Voltage	72V	Specified charging ambient range, C	-10~40℃
Specified Current/Wattage	2000W*2, 50A MAX.	Minimum Rider Age	16
Specified Torque	--		

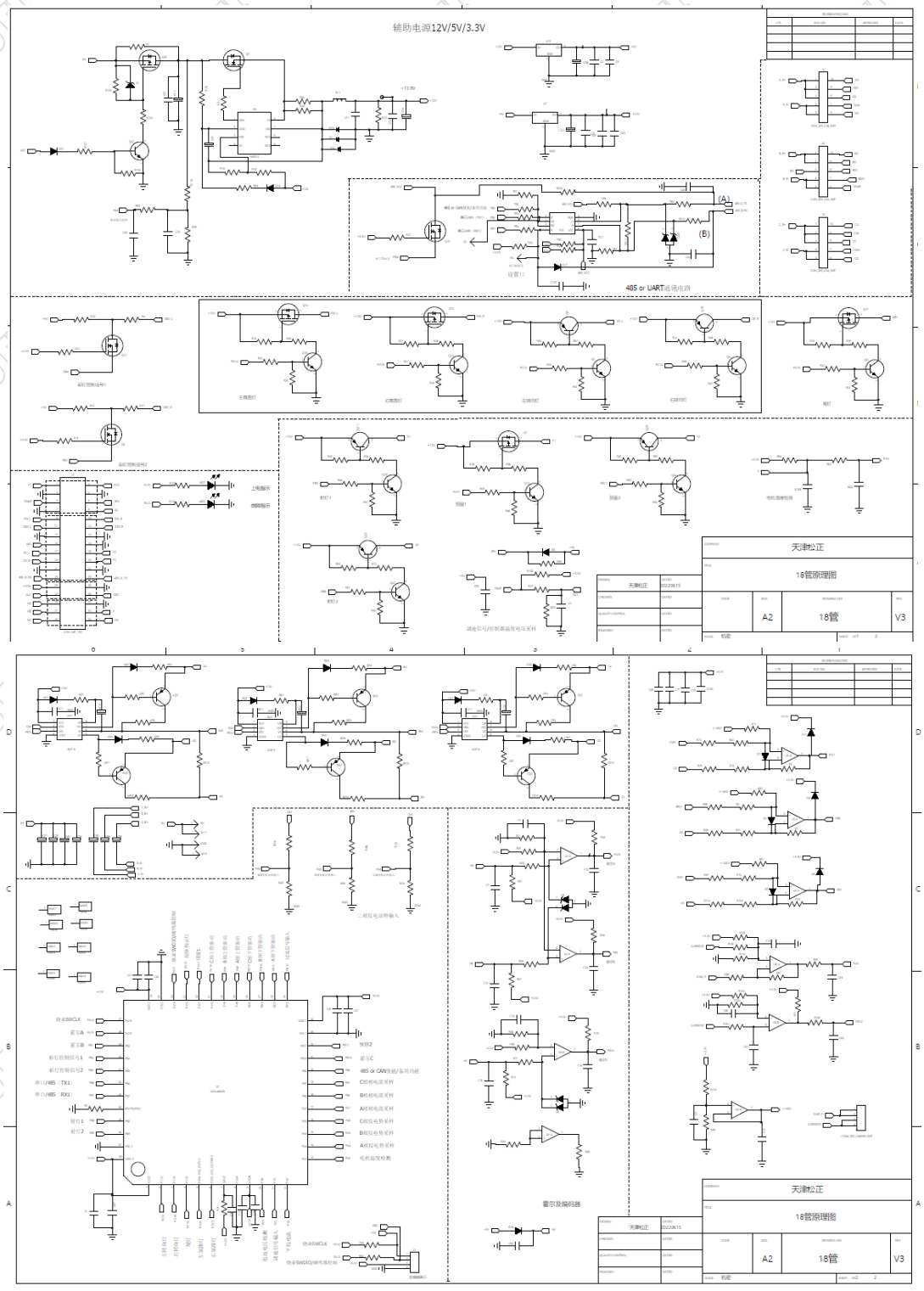
ID 08

Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity1)
Battery Pack	HUIZHOU BLUEWAY ELECTRONICS CO., LTD.	LR1726V	Rated 83.8Vdc, 38.4Ah	--	Test with appliance
Charger	SHENZHEN ALRIGHTPOWER TECHNOLOGY CO., LTD	AP-PF600CH084 00050	INPUT: 100-240V~ 50/60HZ 420W OUTPUT: 84Vdc 5A	UL 1012	UL E522594
PCB	CHENG YI ELECTRONICS (JIAXING) CO LTD	CY-M	V-0, 130 °C	UL 796	UL E225328
PCB (Alternative)	Interchangeable	Interchangeable	FR-4,V-0, 130°C	UL 796	UL
Motor	Jinyuxing Electromechanical Technology (Zhejiang) Co. , Ltd	RS Motor	72V, 2000W	--	Tested with appliance
Controller	Tianjin Santroll Electric Technology Co., Ltd.	C-WZKD7250A-LX-LR1-18G	Max. 90V, Max. 52A	--	Tested with appliance
Plastic enclosure	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AC310(+)	V-0, 60°C	UL 94	UL E162823
Plastic enclosure (Alternative)	Interchangeable	Interchangeable	V-1, 80°C	UL 94	UL
Internal wire	DONGGUAN DEWEI ELECTRONIC CO LTD	1332	300V, 200℃	UL 758	UL E339716

Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity1)
Internal wire (Alternative)	Interchangeable	Interchangeable	300V, 200℃	UL 758	UL
Battery Pack					
PCB	SUNKING CIRCUITS ELECTRONICS CO LTD	SK-06	V-0, 130°C Thickness:1.6mm	UL 796	UL E326765
FUSE(F2, F3)	ADVANCED SURGETECH MATERIALS LTD	A121001-100	125VDC,100A	UL 248-1 UL 248-2-14	UL E470032
FUSE(F1)	ZHONG SHAN LANBAO ELECTRICAL APPLIANCES CO LTD	6125SB20A125V	125V, 20A	UL 248-1 UL 248-2-14	UL E213695
Connector (J1, J2)	Suzhou YSTZ Electronic Technology Co Ltd	A1001VS-2*10P	-20℃ to 85℃ DC 50V	UL 1977	UL E521828
MOS (Q59,Q58, Q57, Q54, Q53,Q73, Q72, Q71)	Wuxi NCE power Co Ltd	NCEP028N12LL	V_{DSS}=120V, I_D=230A, V_{GSS}=±20V,	--	Tested with appliance
MOS (Q66, Q65, Q1)	Wuxi NCE power Co Ltd	NCEP050N12D	V_{DSS}=120V, I_D=130A, V_{GSS}=±20V	--	Tested with appliance
Sampling resistor (R281, R280, R279, R276, R127, R277, R141, R135, R134)	--	--	2mΩ,3W	--	Tested with appliance
IC (U3)	Qingdao Eastsoft Communication Technology Co., Ltd.	ES32F0283	V_{DD}: 1.8-5.5V, T_{OPR}: -40~85°C	--	Tested with appliance
IC (U1,U2)	CellWise Microelectronics Co., Ltd.	OZ7716	V_{DD}: 6-72V, T_{OPR}: -40~85°C	--	Tested with appliance

Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity1)
IC (U13, U12, U7, U6)	CellWise Microelectronics Co., Ltd	CW1051ALGM	V_{DD}: -0.3-36V, T_{OPR}: -30~85°C	--	Tested with appliance
IC (U9)	SG Micro Corp	SGM8477-1	V_{DD}: 1.8-5.5V, T_{OPR}: -40~125°C	--	Tested with appliance
Controller					
MCU (U1)	NATION	N32L406CBL7	V_{DD}: 1.8-3.6V, T_{OPR}: -40~105°C	--	Tested with appliance
Power IC (U8)	Dongguan Huihai Semiconductor Co.,Ltd	H6201L	Output voltage: 5-30V	--	Tested with appliance
Power IC (U15)	Microne	78M05	output voltage: 4.75V-5.25V	--	Tested with appliance
Power IC (U7)	SHIKUES	1117-3.3V	Output voltage: 3.235V-3.365V	--	Tested with appliance

ID 09-1



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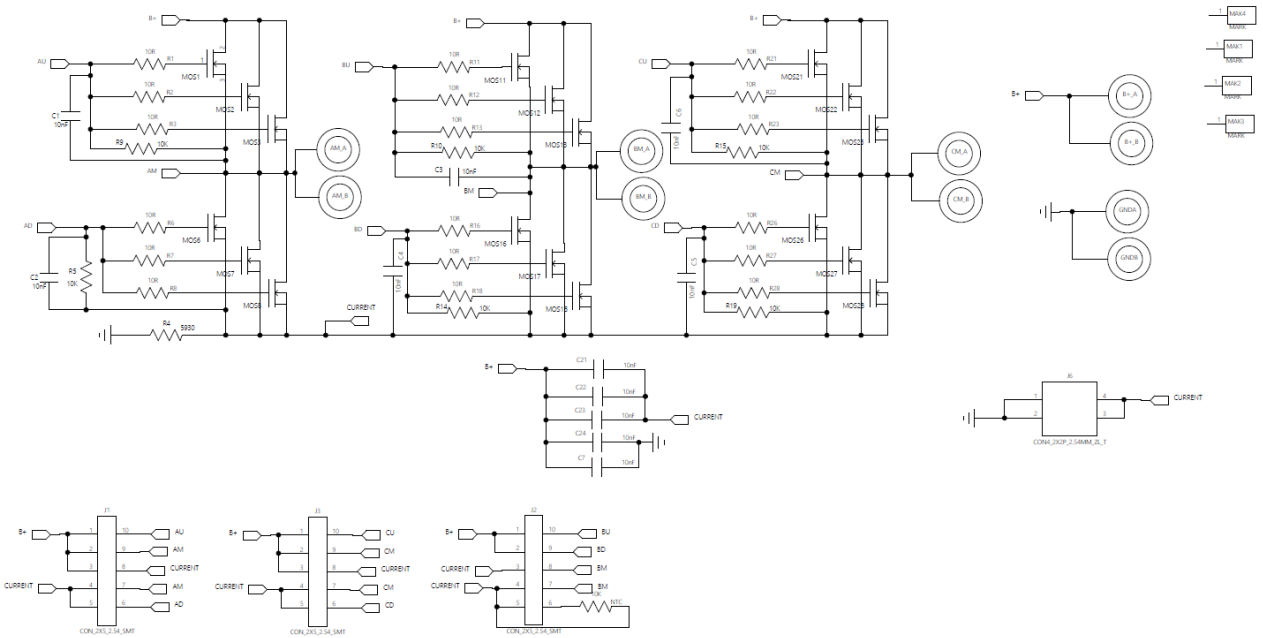

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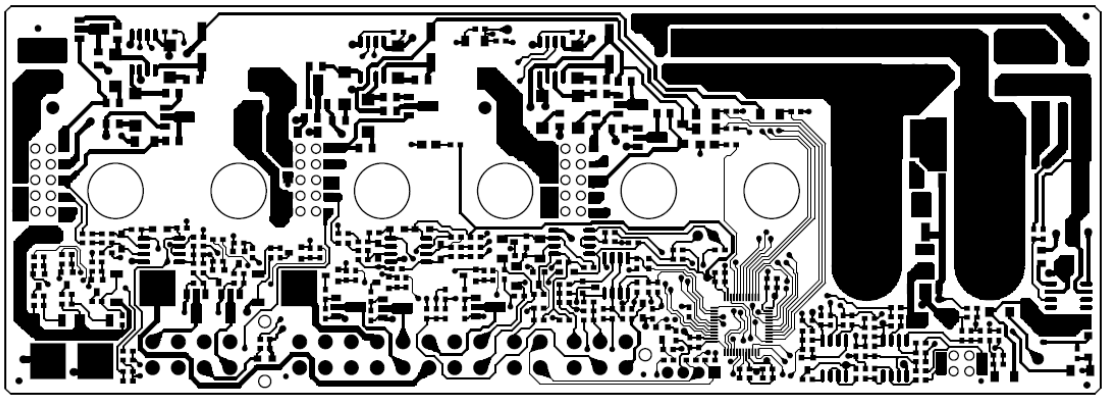
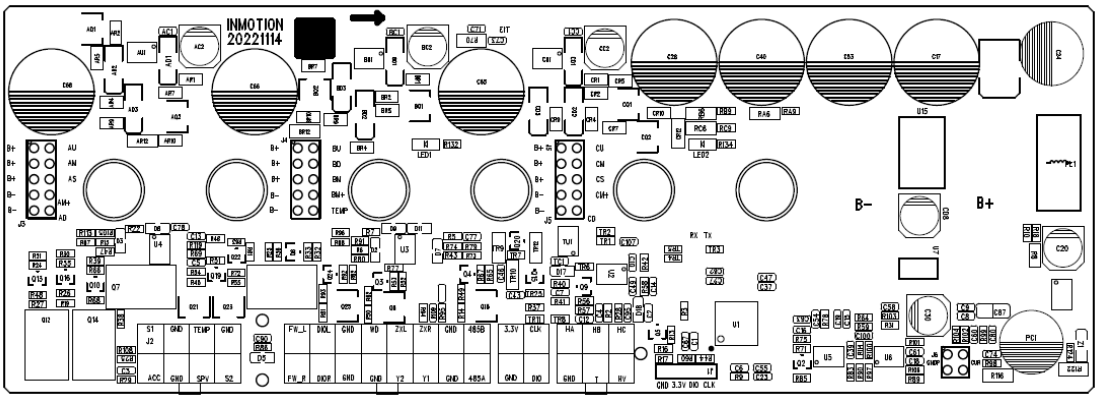
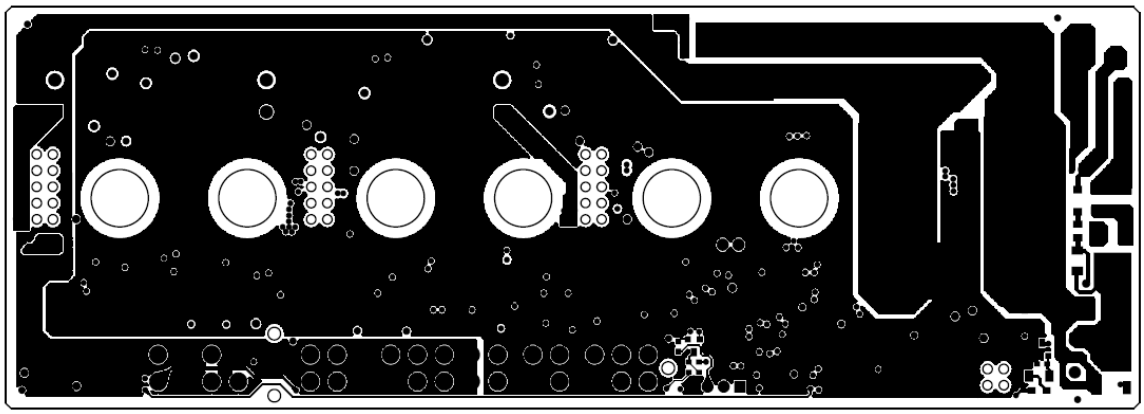
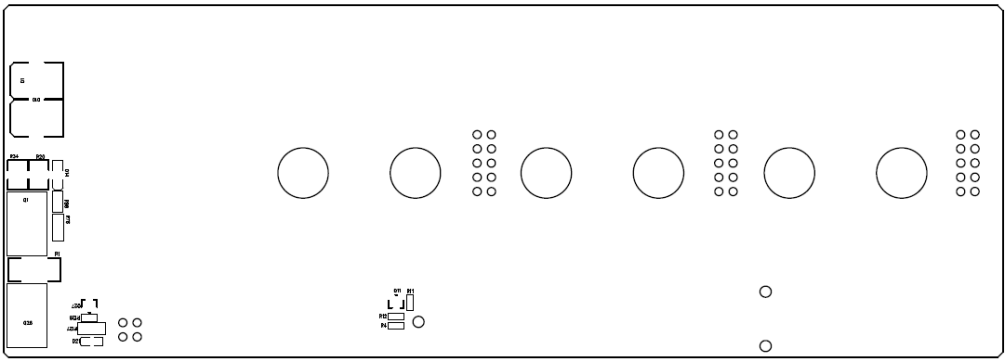
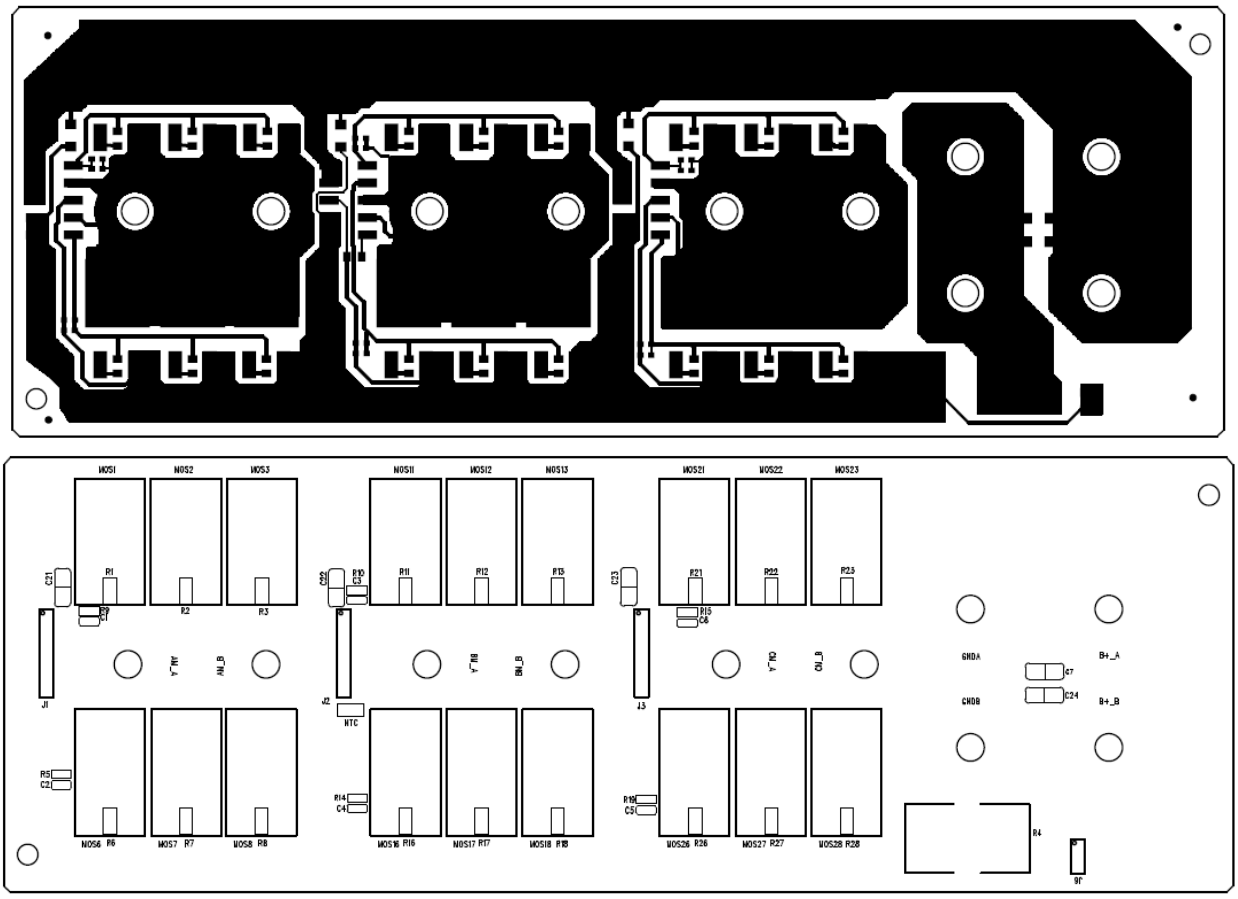




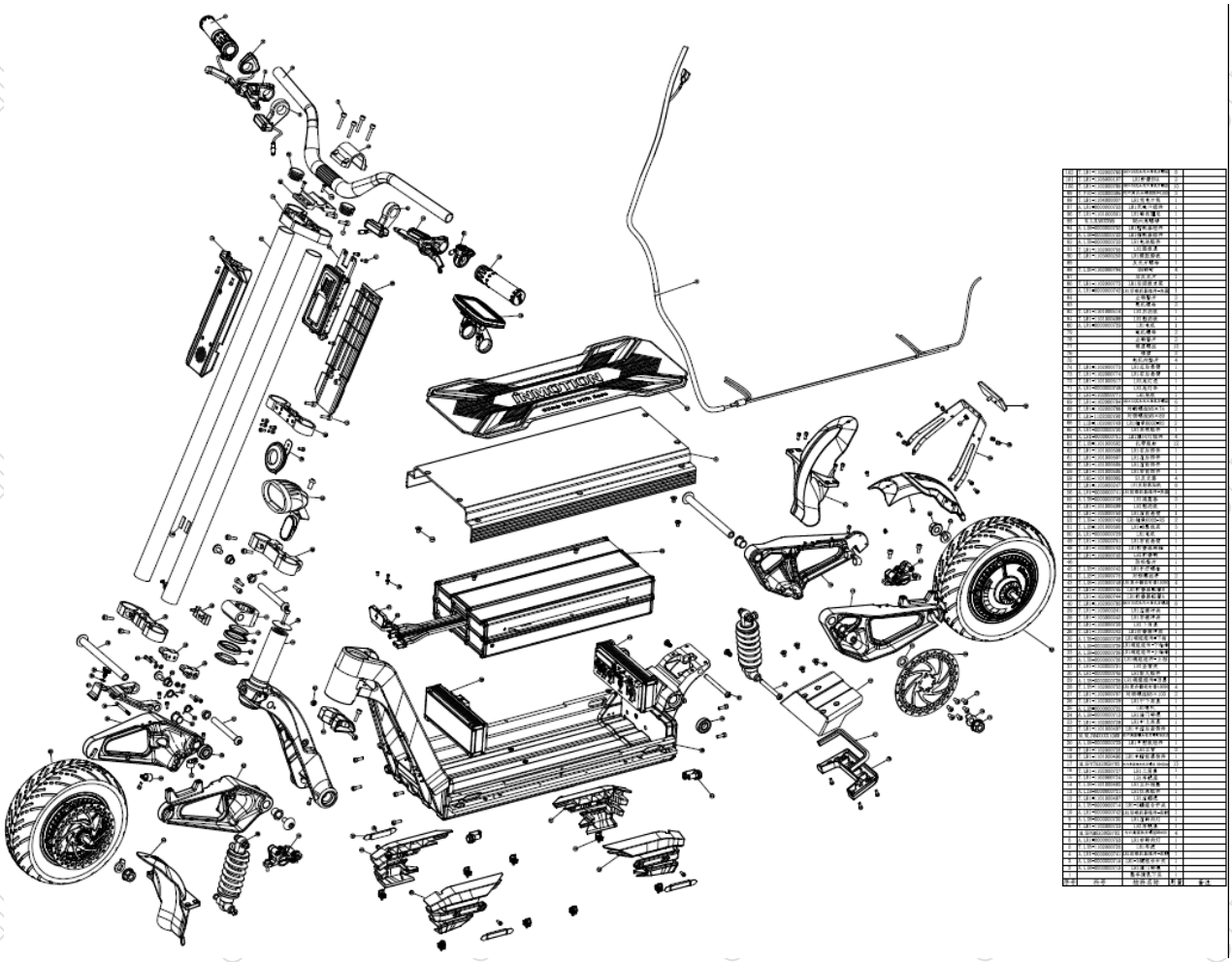




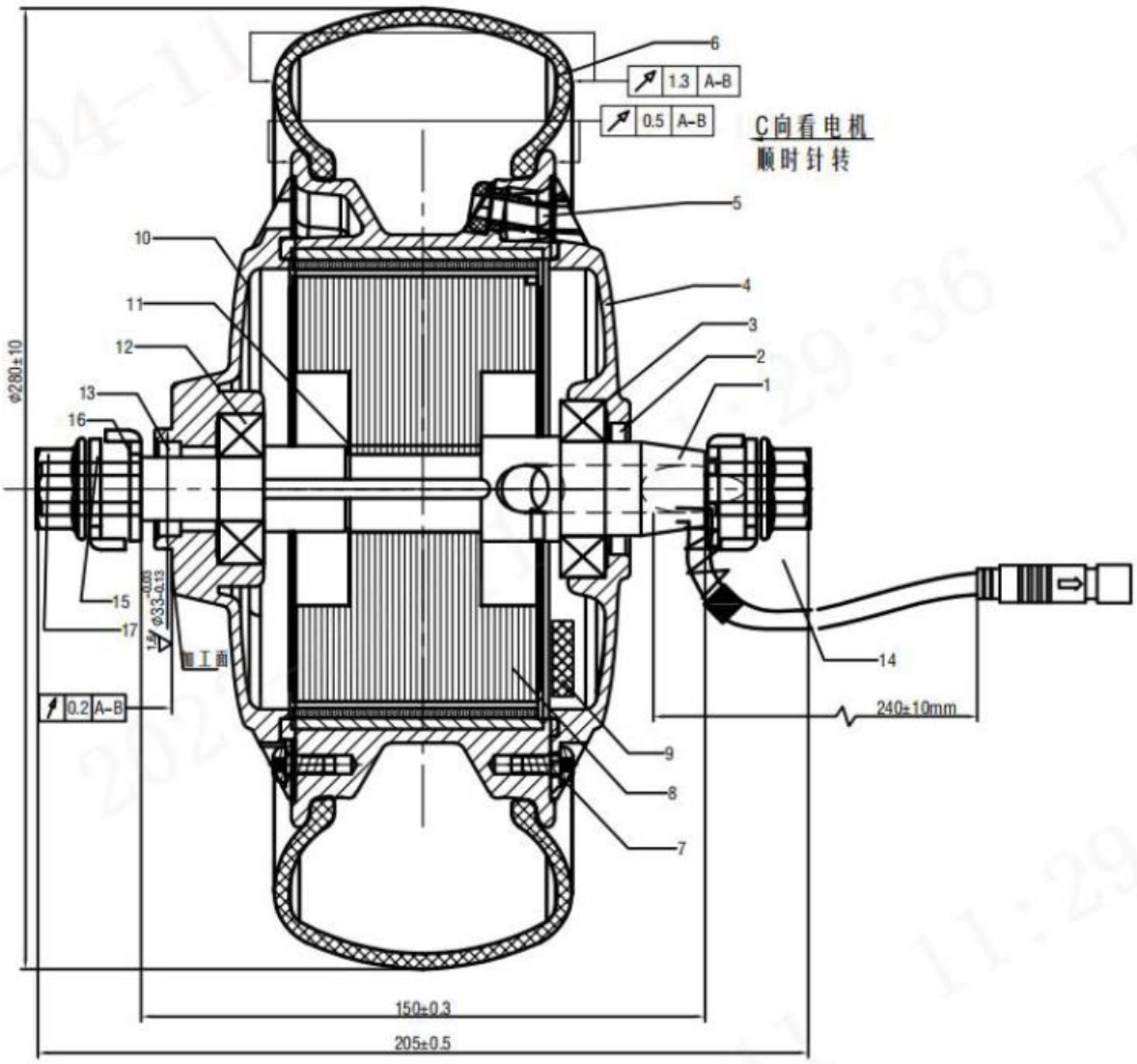
ID10-2



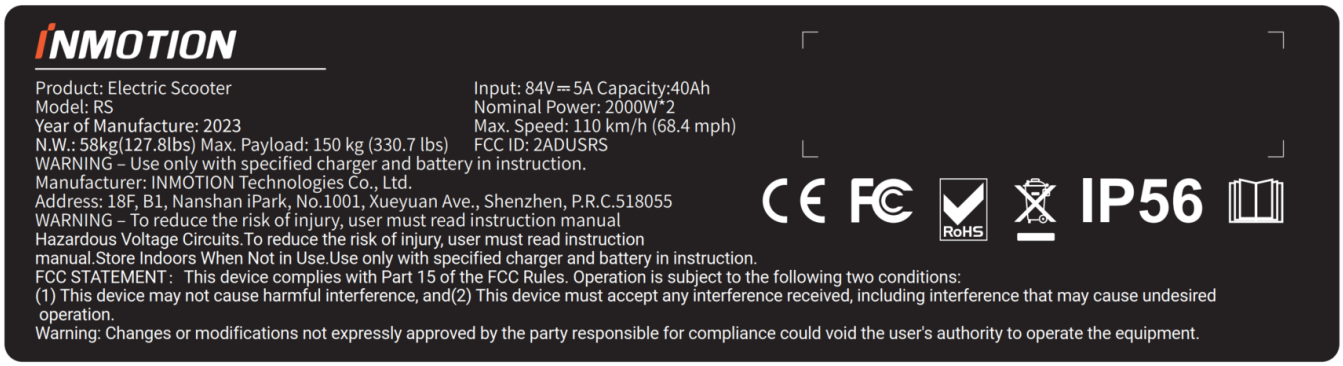
ID 11



ID12


6
1.3 A-B
0.5 A-B
C向看电机
顺时针转
5
10
11
12
13
16
4
3
2
1
φ280±10
15
17
φ33-0.13
0.2 A-B
14
240±10mm
9
8
7
150±0.3
205±0.5

ID 13


INMOTION
Product: Electric Scooter
Model: RS
Year of Manufacture: 2023
N.W.: 58kg(127.8lbs) Max. Payload: 150 kg (330.7 lbs)
WARNING – Use only with specified charger and battery in instruction.
Manufacturer: INMOTION Technologies Co., Ltd.
Address: 18F, B1, Nanshan iPark, No.1001, Xueyuan Ave., Shenzhen, P.R.C.518055
WARNING – To reduce the risk of injury, user must read instruction manual
Hazardous Voltage Circuits.To reduce the risk of injury, user must read instruction manual.Store Indoors When Not in Use.Use only with specified charger and battery in instruction.
Input: 84V⎓5A Capacity:40Ah
Nominal Power: 2000W*2
Max. Speed: 110 km/h (68.4 mph)
FCC ID: 2ADUSRS
RoHS
IP56
FCC STATEMENT: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and(2) This device must accept any interference received, including interference that may cause undesired operation.
Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.