




JIS C 8714 Test Report

Prepared For:	Huiling-tech Robotic Co.,Ltd 6th Floor, Bd. B, Huafeng International Robot Industrial Park, Baoan Dist, Shenzhen,PRC
Product Name:	Electric gripper
Trade Name:	HITBOT
Model:	Z-EFG, Z-EFG-8、Z-EFG-12、 Z-EFG-20、 Z-EFG-30、 Z-EFG-50、 Z-EFG-100、 Z-EMG-4、 Z-ERG-20、 Z-EFGP-100
Prepared By:	Shenzhen BST Technology Co., Ltd. Building No.23-24, Zhiheng industrial park, Guankouer Road, Nantou, Nanshan District, Shenzhen, Guangdong, China.
Test Date:	2020.12.11-2020.12.21
Date of Report:	2020.12.16
Report No.:	BST201215104802LBR



Sample name	English	Electric gripper		
	Model	Z-EFG		
	Additional model	Z-EFG 1522、Z-EFG 1632、Z-EFG 1832、 Z-EFG 2140、Z-EFG 2442、Z-EFG XX32、Z-EFG XX42、S-Arm 1522, S-Arm 1832、 S-Arm 2442、		
Consignor	Huiling-tech Robotic Co.,Ltd			
Address	6th Floor, Bd. B, Huafeng International Robot Industrial Park, Baoan Dist, Shenzhen,PRC			
Manufacturer	Huiling-tech Robotic Co.,Ltd			
Address	6th Floor, Bd. B, Huafeng International Robot Industrial Park, Baoan Dist, Shenzhen,PRC			
Appearance	<div style="border: 1px solid black; padding: 5px;"> <p>Electric gripper Model: Z-EFG Rating(s): DC 24V 5W</p>  <p>Huiling-tech Robotic Co.,Ltd</p> </div>			
Test method	Safety tests for portable Lithium Ion secondary cells and batteries for use in portable electronic applications, JIS C 8714-2007.			
Test items	Crushing of cells、 External short circuit of cells、 Thermal abuse of cells、 Forced Internal Short circuit of cells、 Free fall of batteries、 External short circuit of batteries、 Function of the overcharge protection of batteries.			
Conclusion	<p>The sample has passed the test items of Safety tests for portable Lithium Ion secondary cells and batteries for use in portable electronic applications, JIS C 8714-2007.</p> <p style="text-align: right;">Issue date: 2020-12-19</p>			
Compiler	<i>Daybreak</i>	Checker	<i>WES</i>	Approver



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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)

Testing.....:

Date of receipt of test item.....: 2020.12.16

Date (s) of performance of tests.....: 2020.12.11-2020.12.21

General product information:

Product description:	Lithium Battery
Model	Z-EFG
Rated voltage of single Battery	6V d.c.
Rated capacity of single Battery	24Ah
Rated voltage of single cell	3.2V d.c.
Rated capacity of single cell	1200mAh
Other information	Red wire: (+), Black wire: (-)
Charge method	1200mA CC(constant current) charge to 6V, then CV (constant voltage 6V) charge till charge current decline to $\leq 0.02C$
Max. Charging Current	6A
Max. Charging voltage	5.4V
End of discharge voltage	5.2V



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Clause	Requirement + Test	Result - Remark	Verdict
5	Safety requirements and tests		P
5.1	Charging procedure for test purposes		P
5.2	Crushing of cells		P
	Fully charged cells are crushed between two flat surfaces. The force for the crushing is applied by a crushing equipment exerting a force of $13\text{kN} \pm 1 \text{ kN}$. After the maximum force has been applied, an abrupt voltage drop of one-third of the original voltage has been obtained, or when the cell has been deformed by 10% of the cell height, the force is released.	the maximum force has been applied	P
	A cylindrical or prismatic cell is crushed with its longitudinal axis parallel to the flat surfaces of crushing equipment.	cylindrical cell	P
	To test both wide and narrow sides of prismatic cells, a second set of prismatic cells is tested, rotated 90° around their longitudinal axes compared to the first set.		P
	Results: no fire, no explosion	no fire, no explosion	P
5.3	External short circuit of cells		P
	Fully charged cells were subjected to a short circuit test at $55^\circ\text{C} \pm 5^\circ\text{C}$.		P
	The external resistance is between $80 \text{ m}\Omega \pm 20 \text{ m}\Omega$.		P
	The cells were tested for 24 h or until the case temperature declined by 20% of the maximum temperature rise.	the case temperature declined by 20% of the maximum temperature rise	P
	Results: no fire, no explosion.	See Table 5.3	P
5.4	Thermal abuse of cells	no fire, no explosion	P



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Clause	Requirement + Test	Result - Remark	Verdict
	Fully charged cells were placed in an oven. The oven temperature was raised at a rate of 5°C/min ± 2°C/min to a temperature of 130°C ± 2°C. The cell remained at that temperature for 10 minutes before the test was discontinued.		P
	Results: no fire, no explosion	no fire, no explosion	P
5.5	Forced Internal Short circuit of cells	Japan	P
	The cells complied with national requirement for.....:		P
	The pressing was stopped upon: - A voltage drop of 50 mV has been detected; or		
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached	400N	P
	Results: No fire..... :	See Table 5.5	P
5.6	Free fall of batteries		P
	Fully charged batteries were dropped once in the direction most likely to affect in a negative manner from a height of 1.0 m onto a concrete floor.		P
	Results: no external short circuit, no internal short circuit		P
5.7	External short circuit of batteries		P
	Fully charged batteries were subjected to a short circuit test at 20°C ± 5°C.		P
	The external resistance is between 80 mΩ±20 mΩ.		P
	The batteries were tested for 24 h or until the case temperature declined by 20% of the maximum temperature rise.		P
	Results: no fire, no explosion.		P



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Clause	Requirement + Test	Result - Remark	Verdict
5.8	Function of the overcharge protection of batteries		N/A
	One of the following tests is conducted at ambient temperature of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$. a) When the battery is made of a cell or one cellblock, voltage, which is applied to the cell or one cellblock during charging is measured.		N/A
	b) when the battery consists of a series connection of over two pieces of cell or cellblocks, charging is conducted while measuring the voltage of each cell or each cellblock. At the same time, one of the cells or cellblocks is forcibly discharged gradually, and voltage of the other cells and cellblocks are measured.		N/A
	c) when the battery consists of a the series connection of over two pieces of cell or cellblocks, voltage exceeding upper limited charging voltage, as specified in table 2 is applied to the cell, while measuring the voltage of each cellblock. The voltage is measured, when charging is stopped.		N/A
	Results: upper limited charging voltage of a cell in the battery or of a cellblock made of cells in a parallel connection not exceed the value in table 2.		N/A



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Clause	Requirement + Test			Result - Remark	Verdict
5.3	TABLE: External short circuit of cells				
Model	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (Ω)	Maximum case temperature rise ΔT , (°C)	Results
Samples charged at charging temperature upper limit					
12V24Ah	55.2	3.57	0.08	103.1	P
12V24Ah	55.2	3.58	0.08	105.2	P
12V24Ah	55.3	3.56	0.08	103.3	P
12V24Ah	55.2	3.57	0.08	101.0	P
12V24Ah	55.3	3.58	0.08	100.4	P
Samples charged at charging temperature lower limit					
12V24Ah	55.3	3.55	0.08	111.1	P
12V24Ah	55.2	3.54	0.08	112.4	P
12V24Ah	55.2	3.53	0.08	105.3	P
12V24Ah	55.3	3.52	0.08	107.3	P
12V24Ah	55.3	3.52	0.08	100.5	P



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Clause	Requirement + Test	Result - Remark	Verdict

5.5	TABLE: Forced Internal Short circuit of cells				P
Model	Chamber ambient, (°C)	OCV at start of test, (Vdc)	Particle location 1)	Maximum applied pressure, (N)	Results
12V24Ah	45	3.51	Between positive active Material and negative active Material	400	P
12V24Ah	45	3.57		400	P
12V24Ah	45	3.58		400	P
12V24Ah	45	3.57		400	P
12V24Ah	45	3.58		400	P
12V24Ah	10	3.56		400	P
12V24Ah	10	3.56		400	P
12V24Ah	10	3.57		400	P
12V24Ah	10	3.58		400	P
12V24Ah	10	3.57		400	P



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Clause	Requirement + Test	Result - Remark	Verdict

5.7	TABLE: External short circuit of batteries				p
Model	Ambient, (°C)	OCV at start of test, (Vdc)	Resistance of circuit, (Ω)	Maximum case temperature rise ΔT, (°C)	Results
Samples charged at charging temperature upper limit					
12V24Ah	23.2	12.78	0.08	23.3	p
12V24Ah	23.3	12.76	0.08	23.4	p
12V24Ah	23.3	12.77	0.08	23.3	p
12V24Ah	23.3	12.76	0.08	23.4	p
12V24Ah	23.2	12.74	0.08	23.3	p
Samples charged at charging temperature lower limit					
12V24Ah	23.2	12.76	0.08	23.3	p
12V24Ah	23.2	12.75	0.08	23.3	p
12V24Ah	23.2	12.74	0.08	23.4	p
12V24Ah	23.3	12.75	0.08	23.3	p
12V24Ah	23.3	12.74	0.08	23.4	p



Sample photos

