

PORTAPOWER (HK) LIMITED

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SPEC. NO.	KLC40HU33x.XXX	ISSUE DATE	2017-4-11		
DESCRIPTION	Lithium Ion Battery For E-bike	EDITION	0	PAGE	1/12

1. Applicability

The specification is applicable to PortaPower Lithium Ion Rechargeable batteries

1.1 Product code

KLCxxHUyyz.nnn	E-bike Battery (with Gas Gauge) 4P13S
KLC: Customer E-bike/Power pack serial code xx: Customer Code H: This product maximum continue discharge current up to 15A U: Communication with UART yy: Serial Number z: Color nnn: Cell Type	

2. Ratings

2.1 Cell

Item	KLC40HU33B.804		
Type of Cell	Sealed Lithium-ion cylindrical Rechargeable battery		
Cell Size/Num	18650		
Cell Model	PSI NCR18650B		
Cell UL Number	MH12210		
Cell Typical capacity	3350mAh		
Cell Minimum capacity	3250mAh		
Max.discharge current	4875mA		
Item			
Type of Cell			
Cell Size			
Cell Model			
Cell UL Number			
Cell Typical capacity			
Cell Minimum capacity			
Max.discharge current			

2.2 Pack

2.2.1 Rated voltage & Maximum Charge Voltage

Series	Rated voltage	Maximum Voltage	Maximum Charge Voltage
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13S	46.8V	54.6V	55.25V
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2.2.2 Internal impedance: Less than 244mohm

2.2.3 Capacity

Model no.	Typical Capacity	Minimum Capacity
KLC40HU33B.804	13.4Ah	13Ah

2.2.4 Charge Current

Model no.	Standard charge current	Maximum charge current
KLC40HU33B.804	1350mA	2350mA

2.2.5 Standard and Maximum discharge current

Model no.	Standard discharge current	Max. continue discharge current	Max. Pulse discharge current	
			10min.	5S
KLC40HU33B.804	2.6A	15A	18A	35A

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2.2.6 Safety Device and Function Requirement

Item	Spec.
Overcharge Protection	4.30±0.025V/cell
2nd-Level Overcharge protection	4.45±0.025V/cell
Over discharge Protection	2.50±0.08V/cell
Over current protection	40A±5A
Short Current Protection	OUT+/OUT- Short Current
Temperature protection	>70°C: Can not Charge & Discharge <0°C or >50°C: Can not Charge
Reverse charge Protection	Can not charge
Build-in Gas Gauge	Using UART communication standard
Sleep mode Function	The battery circuit will automatically cut off power output in 2 hours after battery activation and load under 2000 mA

2.2.7 Operating temperature:

- 0 - 45°C (standard charge)
- 10 - 45°C (quick charge)
- -20 - 60°C (standard discharge)

2.2.8 Storage temperature:

- -20 - 50°C (1 week)
- -20 - 45°C (1 month)
- -20 - 40°C (6 months)
- -20 - 35°C (1 year)

2.2.9 Sleep/Charge Mode function:

a. Use power switch or LED button to control battery power ON/OFF. Please see following table.

Function	LED Button	Power Switch
Power ON	Press LED Button	Switch ON
Power OFF	Press and hold "3s" LED Button	Switch OFF
Check Battery Power	Press LED Button	Nil

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Remark: When battery is turn ON, the one of LED ON, until the battery turn OFF or sleep mode active.

- b. Charge mode:
1. The battery will stop discharge and the one of LED ON.
 2. The sleep mode will off, until the charger plug out.

P.S. The Battery LED will not show the charge status, Customer should be check by charger LED (Please see the charger user menu).

2.3 Test conditions

Unless otherwise specified, all tests should be conducted within one

Month of delivery under the following conditions:

- Ambient temperature: 20 +/- 5°C.
- Relative humidity: 65 +/- 20%.

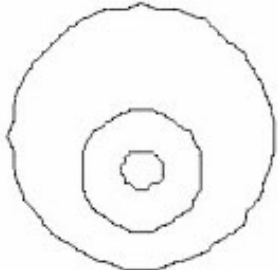
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3. Charge and discharge Port Pin definition

Charge Port	Discharge port						
<p>DC2.1</p> 	TBD						
<table border="1"><thead><tr><th>Pin No.</th><th>Polarity</th></tr></thead><tbody><tr><td>CENTER</td><td>Positive (+)</td></tr><tr><td>OUTER</td><td>Negative (-)</td></tr></tbody></table>	Pin No.	Polarity	CENTER	Positive (+)	OUTER	Negative (-)	
Pin No.	Polarity						
CENTER	Positive (+)						
OUTER	Negative (-)						

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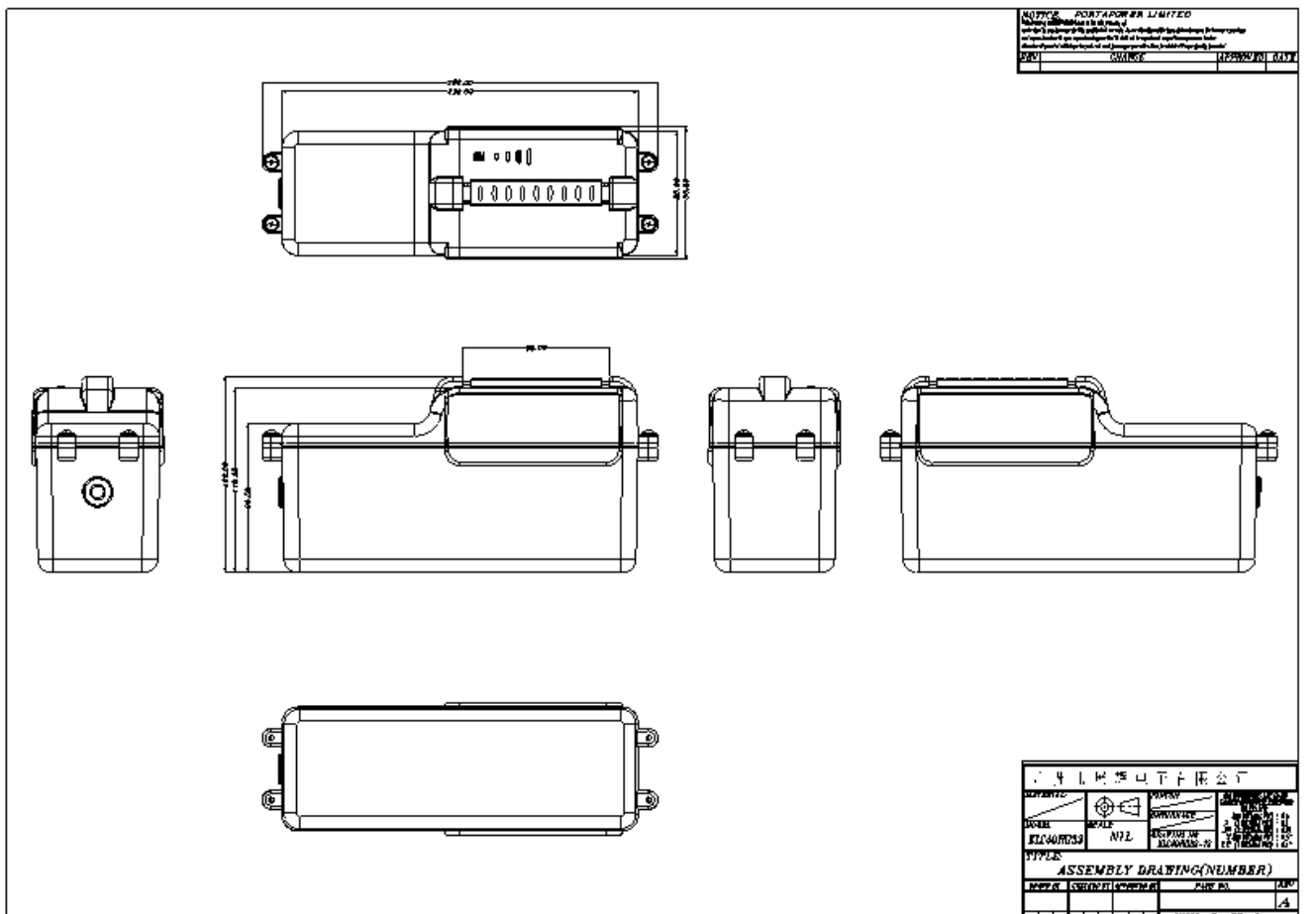
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4. Dimensions:

Material of Case	Plastic(ABS+PC UL V-0VA)	Battery weight	Approx. 3024±5g
Color	/	Switch Control	Rocker switch



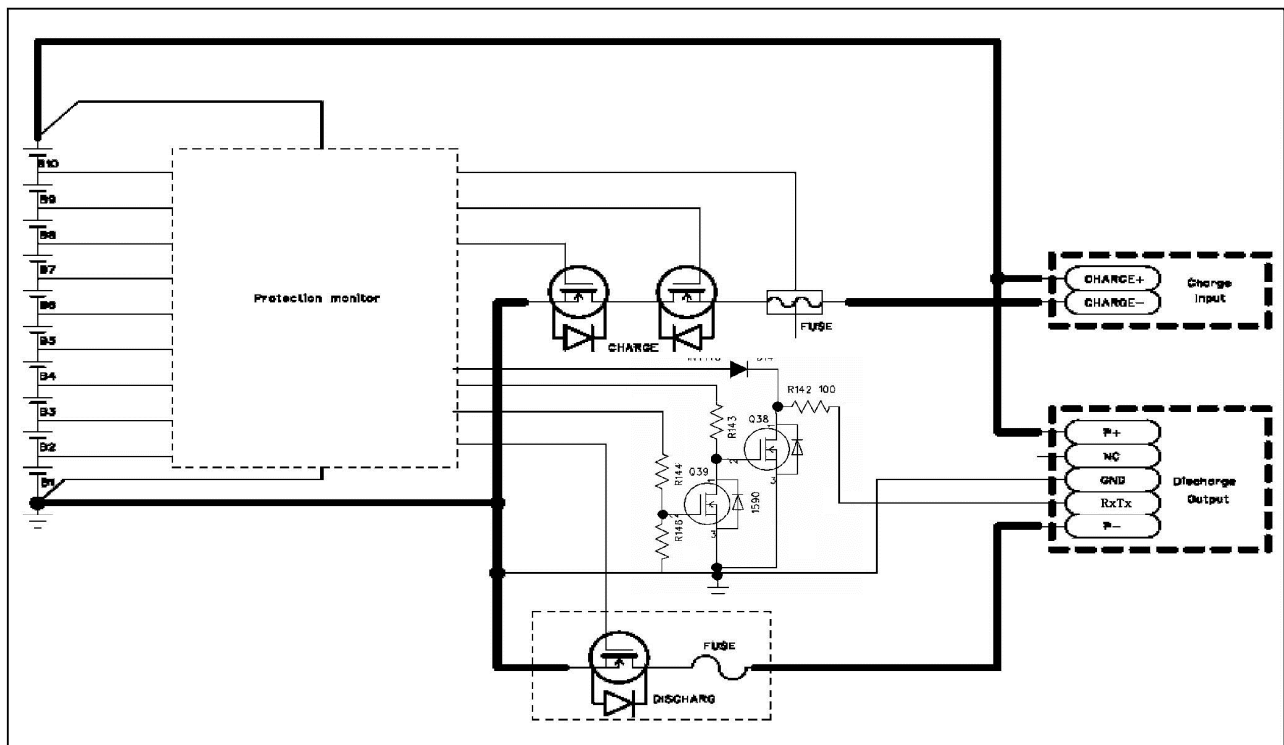
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5. An Circuit diagram for connect battery and UART communication module



Note:

- Battery designed for URAT communication standard, the signal wire RxTx with reference to GND ONLY. Do not directly or indirectly connect GND and P-.
- Our smart battery designed for only connect with the specify product. If customer use other equipment to communication, Please note the following information.

Problems related to incorrect reference connections:

Case	use P- instead of GND					Connect P- with GND			
	No load		Loading			No load	Loading		
Protection Status	NORMAL	/	Over Discharge	/	NORMAL	/	NORMAL	/	Over Discharge
Switch	ON	OFF	ON	OFF	ON	/	ON	Off	/
Result	Can communicate with Battery	No communication with Battery	Permanent damage on 100ohm Resistor	Unreliable communication with Battery	Battery can not turn off	Unreliable communication with Battery	Permanent damage on GND wire		

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6. UART

6.1 Baud Rate: 57600, StopBits: 1, Parity: No, DataBits: 8

6.2 The master sends data sequence: 55 AA 06 0A 00 00 00 21 31



6.3 The master pull-down UART RxTx line low for more than 200uS to wake up the battery pack.

6.4 Then send data 0X55, 0XAA, 0X06, 0X0A, 0X00, 0X00, 0X00, 0X21, 0X31, battery will return back data group

As follow:

sequence	Return data		remark
0	AA		
1	55		
2	27		
3	0B		
4	XX		
5	XX		
6	XX		
7	XX		//temperature high byte (0.1K)
8	XX		// temperature low byte (0.1K)
9	XX		//volt high byte (mV)
10	XX		// volt low byte (mV)
11	XX		//current high byte (mA)
12	XX		// current low byte (mA)
13	XX		//remain capacity percentage %
14	XX		// remain capacity high byte (mAh)
15	XX		// remain capacity low byte (mAh)
16	XX		//cycles high byte
17	XX		// cycles low byte
18	XX		/
19	XX		/
20	XX		/
21	XX		/
22	XX		/
23	XX		/
24	XX		/
25	XX		/
26	XX		/
27	XX		/
28	XX		/

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7. Performance (Note 1)

Item	Criteria	Test conditions
Capacity	Above Minimum Capacity	Standard charge and standard discharge
Internal impedance	Refer to Model detail	Measure AC impedance at 1kHz
Cycle life (Note 2)	Above 0.7* Typical Capacity	300 cycles charging/discharging is repeated in the below condition. <ul style="list-style-type: none"> ● Charging: Standard Charge ● Rest time: 20min ● Discharging: Standard Discharge ● Temperature: 25±2°C
Leakage resistance	No leakage	Visually inspect battery pack after standard charge and storage at 25°C for 14 days.
Drop test	No fire, no explosion, no leakage (max. weight loss 0.1%)	Drop battery pack after standard charged onto a bakelite floor from a height of 50 cm for 6 times.
Vibration test	No fire, no explosion, no leakage (max. weight loss 0.1%)	The battery pack is vibrated in triaxial direction with 4 mm amplitude of frequency 30 Hz for 1 minute in each direction.
Short circuit test	No fire, no explosion, cell temperature shall not exceed 150°C	External short circuit
Appearance	No crack, no leakage, no deformation	Visual inspection

Note:

Data provided under "Cycle Life" in this document is our best estimate based on the technical data supplied by battery cell manufacturer in the Product Specification Form.

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8. Warranty

Two year limited warranty against workmanship and material defects. Manufacturer reserves the right to alter, amend the design, model and specification without prior notice.

9. Charge state of cell before shipment

Charge from 50% to 90% according to delivery condition.

10. Safety precaution

Please follow the safety precaution carefully as improper handling of lithium ion batteries may result in injury or damage from electrolyte leakage, heating ignition or explosion. To ensure safety, consult with PortaPower (HK) Limited regarding the charge and discharge specifications, equipment structure, warning labels and other important details when designing equipment to use PortaPower (HK) Limited rechargeable lithium ion batteries.

- Never charge the battery above 55.25V.
- Never reverse charge the battery.
- Never heat or incinerate the battery.
- Never pierce, crush or cause mechanical damage to the battery.
- Never charge a battery at high temperature condition, such as at or near a fire.
- Never short circuit the battery.
- Never discharge a battery to below 35.75V.
- Never allow the battery to get wet or be immersed in water.
- For long period of storage, temperature should be below 45°C
- After long period of storage, battery may required some cycling to recover capacity.
- When disposing of secondary cells or batteries, keep cells or batteries of different electrochemical systems separate from each other.
- Fully discharge each battery and collect each battery according to local regulations.

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11. Packaging specification:

Battery

Air column bag

Box

Envel tape

Package dimensions
dimensions: 230*164*134mm
Weight: 1.9kg

Item	Materials	Descriptions
1	Battery	36V 10S3P
2	Air column bag	300*290*0.6mm
3	Box	230*164*134mm
4	Label	38*15*0.15mm

