SPEC. NO.	KL24H95x.XXX/ KL24HS95x.XXX Series	ISSUE DATE		2016-6-28	
DESCRIPTION	Lithium Ion Battery For E-bike	EDITION	B	PAGE	1/10

1. Applicability

The specification is applicable to Mondia Lithium Ion Rechargeable batteries

1.1 Product code

KLxxHyyz.nnn	E-bike Battery (without Gas Gauge) 5P7S
KLxxHSyyz.nnn	E-bike Battery (with Gas Gauge) 5P7S

KL: E-bike/Power pack serial code
xx: Voltage level
H: This product maximum continue discharge current up to 15A
S: This product Build in Gas Gauge function
yy: Serial Number
z: Color
nnn: Cell Type

2. Ratings

2.1 Cell

Item	KL24H95x.082 KL24HS95x.082	KL24H95x.083 KL24HS95x.083	KL24H95x.089 KL24HS95x.089
Type of Cell	Sealed Lithium-ion cylindrical Rechargeable battery		
Cell Size	18650		
Cell Model	PSI UR18650AA	YL INR18650A220	PSI NCR18650PF
Cell UL Number	MH12383	MH45794	MH12210
Cell Typical capacity	2250mAh	2200mAh	2900mAh
Cell Minimum capacity	2150mAh	2100mAh	2750mAh
Continuous Discharge current	5A	4.4A	10A

Item	KL24H95x.802 KL24HS95x.802	KL24H95x.806 KL24HS95x.806	
Type of Cell	Sealed Lithium-ion cylindrical Rechargeable battery		
Cell Size	18650		
Cell Model	PSI CGR18650CH	Samsung ICR18650-26H	
Cell UL Number	MH12210	MH21015	
Cell Typical capacity	2250mAh	2600mAh	
Cell Minimum capacity	2150mAh	2550mAh	
Continuous Discharge current	10A	5.2A	

2.2 Pack

2.2.1 Rated voltage & Maximum Charge Voltage

Series	Rated voltage	Maximum Voltage	Maximum Charge Voltage
7S	25.2V	29.4V	29.75V

2.2.2 Internal impedance: Less than 200mohm

2.2.3 Capacity

Model no.	Typical Capacity	Minimum Capacity
KL24H95x.082 KL24HS95x.082	11. 25Ah	10. 75Ah
KL24H95x.083 KL24HS95x.083	11Ah	10. 5Ah
KL24H95x.089 KL24HS95x.089	14. 5Ah	13. 75Ah
KL24H95x.802 KL24HS95x.802	11. 25Ah	10. 75Ah
KL24H95x.806 KL24HS95x.806	13Ah	12.75Ah

2.2.4 Charge Current

Model no.	Standard charge current	Maximum charge current
KL24H95x.082 KL24HS95x.082	1350mA	2350mA
KL24H95x.083 KL24HS95x.083	1350mA	2350mA
KL24H95x.089 KL24HS95x.089	1350mA	2350mA
KL24H95x.802 KL24HS95x.802	1350mA	2350mA
KL24H95x.806 KL24HS95x.806	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
KL24H95x.082 KL24HS95x.082	2.15A	15A	18A	35A

KL24H95x.083 KL24HS95x.083	2.2A	15A	18A	35A
KL24H95x.089 KL24HS95x.089	2.7A	15A	18A	35A
KL24H95x.802 KL24HS95x.802	2.15A	15A	18A	35A
KL24H95x.806 KL24HS95x.806	2.6A	15A	18A	35A

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±0.025V/cell
Over current protection	40A±5A
Short Current Protection	OUT+/OUT- Short Current
Temperature protection	>70℃: Can not Charge & Discharge <0℃ or >50℃: Can not Charge
Cell balancing	>4.18V Balancing Action
Reverse charge Protection	Can not charge
Build-in Gas Gauge	Using HDQ communication standard

2.2.7 Operating temperature:

- **0 - 45℃ (standard charge)**
- **10 – 45℃ (quick charge)**
- **-20 - 60℃ (standard discharge)**

2.2.8 Storage temperature:

- **-20 - 50℃ (1 week)**
- **-20 - 45℃ (1 month)**
- **-20 - 40℃ (6 months)**
- **-20 - 35℃ (1 year)**

2.3 Test conditions

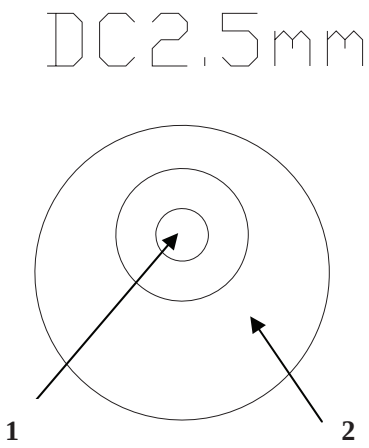
Unless otherwise specified, all tests should be conducted within one

Month of delivery under the following conditions:

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

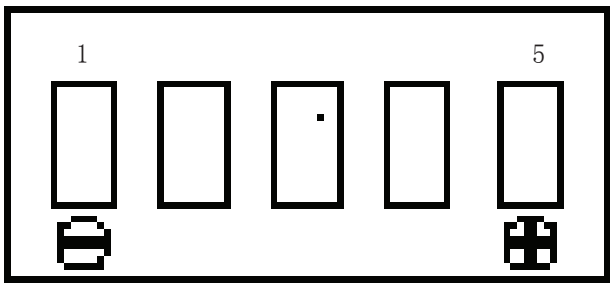
3. Charge and discharge Port Pin definition

Charge Port



	Pin No.	Polarity
1	Center pin	Positive (+)
2	Outer	Negative (-)

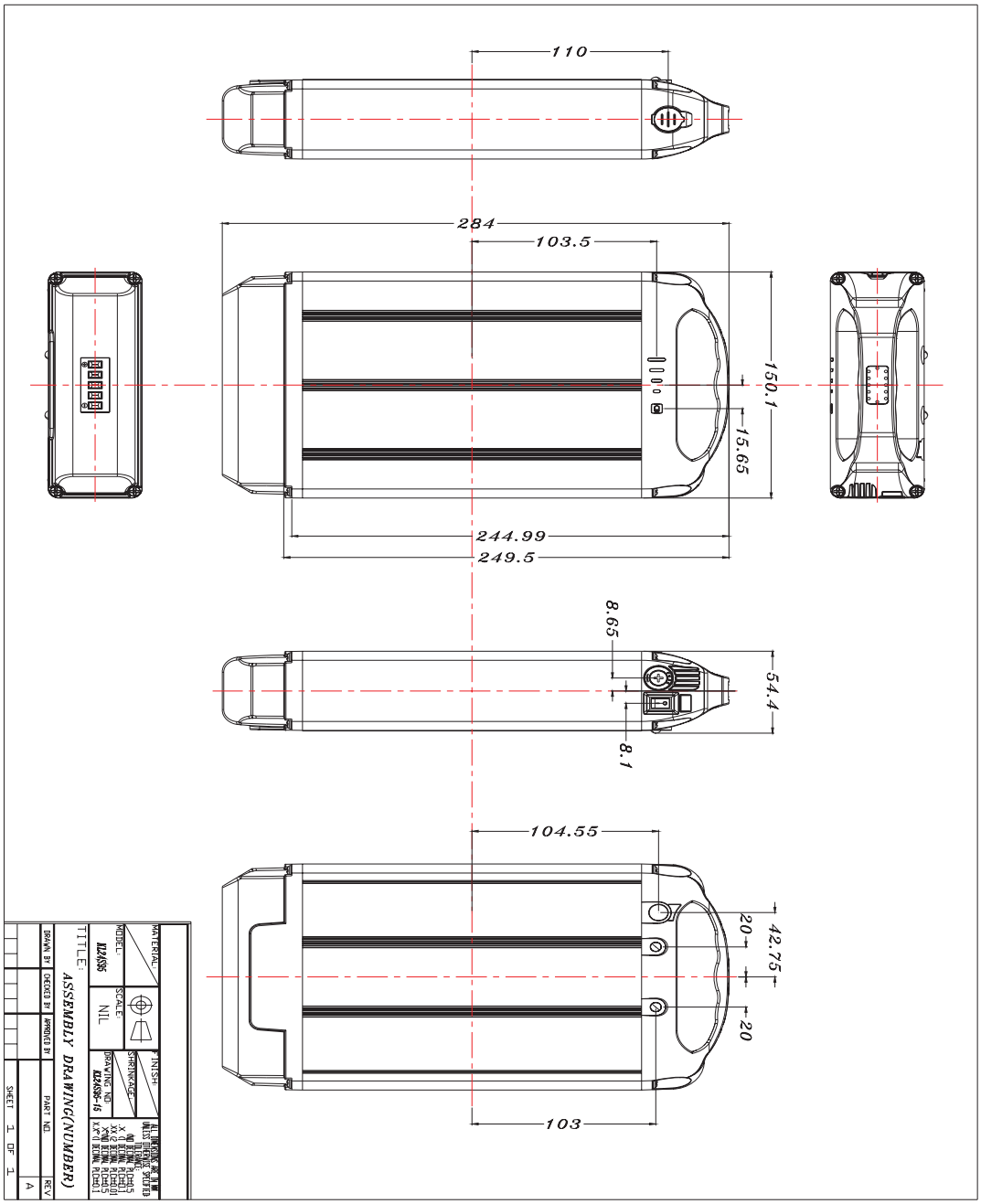
Discharge port



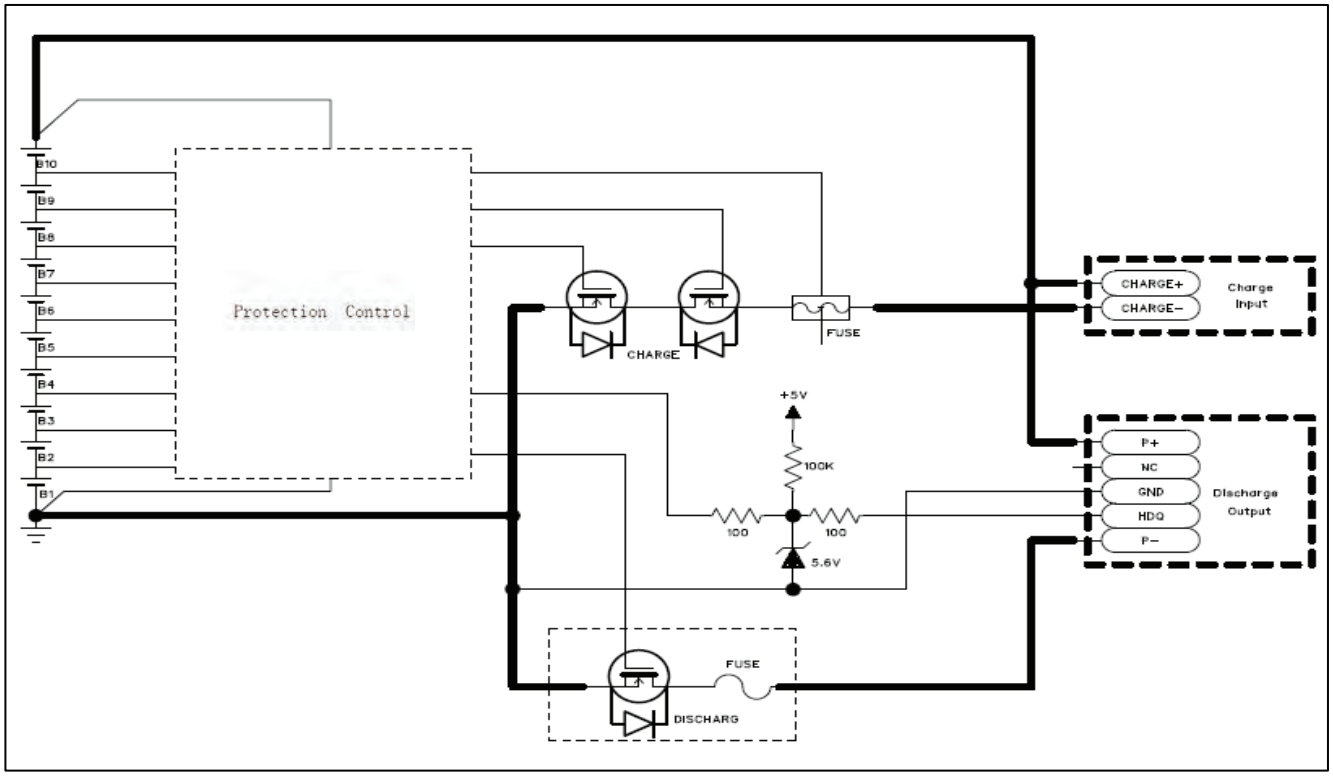
Pin No.	KL24HS95X	KL24H95X
1	Negative(P-)	Negative(P-)
2	HDQ	NC
3	NC	NC
4	GND(communication)	NC
5	Positive (P+)	Positive(P+)

4. Dimensions:

Material of Case	Plastic(ABS+PC UL V-0VA)	Battery weight	Approx.1390g
Color	/	Switch Control	Rocker switch



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



Note:

1. Battery Communication is single wire HDQ with reference to GND ONLY. Do not directly or indirectly connect GND and P-.
2. Our smart battery designed for HDQ communication standard and 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			
Load	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	

6. 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. ● Charging: Standard Charge ● Rest time: 20min ● Discharging: Standard Discharge ● Temperature: 25±2℃
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℃	External short circuit
Appearance	No crack, no leakage, no deformation	Visual inspection

Note:

1. Unless otherwise specified, all tests should be conducted within one month of delivery under the following conditions :
   - Ambient temperature: 20 +/- 5℃.
   - Relative humidity: 65 +/- 20%.
2. 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.

7. 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.

8. Charge state of cell before shipment

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

9. 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 Master Instuments P / L regarding the charge and discharge specifications, equipment structure, warning labels and other important details when designing equipment to use with rechargeable LiIon batteries supplied by Master Instruments Pty Ltd.

- Never charge the battery above 29.4V.
- 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 21V.
- Never allow the battery to get wet or be immersed in water.
- For long period of storage, temperature should be below 45℃
- 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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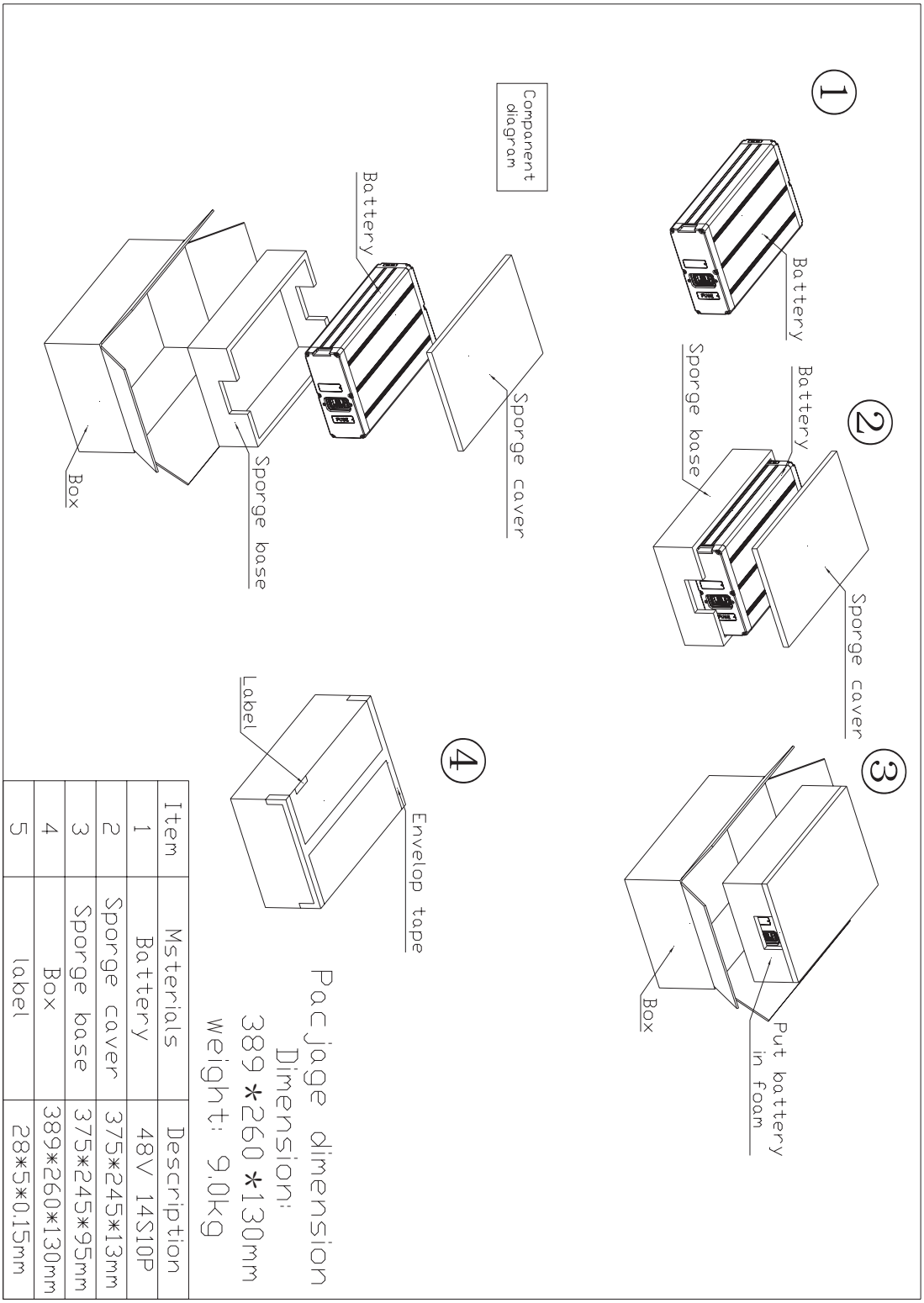
10. Packaging specification:



Item	Msterials	Description
1	Battery	48V 14S10P
2	Sporge caver	375*245*13mm
3	Sporge base	375*245*95mm
4	Box	389*260*130mm
5	label	28*5*0.15mm

11. Data Sheet Change Log:

Date	Change	Note
2013-01-03	First Edition issued	A
2014-9-16	Second Edition issued	B