

# KL5M lamp & NWB-15 charger instruction manual

KL5M LED Li-ion Cap Lamp  
NWB-15 Portable Charger  
NWCR Series Charger Rack for KL5M LED Cap Lamp  
Summary of the advantages of the products are  
Usage, Maintenance and Safety Notes  
KL5M Parts Drawing  
CE Certification KL5M  
CE Certification NWB-15

## TABLE OF CONTENTS

KL5M LED Li-ion Cap Lamp .....	2
Product Features: .....	3
Technical Parameter and Specifications: .....	3
NWB-15 Portable Charger .....	3
Usage Guide: .....	4
Maintenance: .....	4
Charging Theory: .....	4
Technical Specifications: .....	4
Packaging Specifications for the KL5M and NWB-15 .....	4
NWCR Series Charger Rack for KL5M LED Li-ion Cap Lamp .....	4
Technology parameter: .....	5
Usage Guide: .....	6
Notes: .....	6
Charging Chart: .....	7
Charger Rack Design Schematic: .....	7
Summary of the advantages of the products are: .....	7
Usage, Maintenance and Safety Notes: .....	8
The Li-ion Battery: .....	8
The Head Lamp .....	8
Users Guide .....	8
Maintenance .....	9
Troubleshooting .....	9
KL5M part drawing .....	10
CE Certification KL5M .....	11
CE Certification NWB-15 .....	12

## KL5M LED Li-ion Cap Lamp

The innovatively designed KL5M LED Li-ion Cap Lamp combines the latest lighting and battery technologies to result in a brighter and lighter cap lamp. Using lithium-ion technology in conjunction with a purposely designed LED, the cap lamp is designed in accordance with the Restriction of Hazardous Substances Directive (RoHS). The KL5M is not only much smaller and ergonomically designed for wearer more comfortable than the traditional lead acid cap lamp, but also it is one third of the weight at only 0.6kg. The use of lithium-ion technology also



removes numerous hazards associated with the use of lead acid style batteries. Unlike traditional lead acid batteries, lithium-ion contains no dangerous chemicals or heavy metals and requires no maintenance such as topping up of acid. The KL5M significantly reduces cost of ownership with no requirement to replace bulbs and a service life three times longer than lead acid batteries. The cap lamp is also intrinsically safe and CE Certified (EN60079-0:2004, EN62013.1:2002, EN50020:2002, EN50033:1991) for use in explosive atmospheres.

The KL5M was first introduced to the market in 2003 and has undergone constant refinements and improvements. The cap lamp is designed to withstand the harshest underground conditions and is manufactured from impact and temperature resistant Makrolon plastic material. The KL5M when fully charged holds its charge until use and will provide 15 hours of continuous light. To prolong the life of the cap lamp battery, the Lithium-ion battery has an over charge protection system that will automatically cut off the circuit to protect the battery from being over charged. Additionally, there is an automatic power off in the cap lamp so that if the surface of the lamp or the LED is broken it will automatically turn the power off for protection.



The 2007 version of the KL5M LED Li-ion Cap Lamp has many improved features from its predecessor. A purposely designed LED with an upgraded antistatic capacity provides luminous flux of 120-150lm and increased brightness at 7,000-11,000lux. A new radiator in conjunction with the purposely designed LED has significantly reduced the amount of heat experienced at the glass. In addition, the cap lamp's flood and spot light settings are operated by an upgraded push button. As an added safety feature the cap lamp now also incorporates a low battery warning with the last hour of discharge flashing every 5-10 seconds to warn the user. And the version 2008 is mainly improved on the base of the version 2007 to make the lamp absolutely waterproof and better function of the button switch. In 2009, we successfully get MSHA approval of USA, the approval number is 19-A090001-0. We are the first one and the only one in Asia who has this MSHA approval. In the same year, we improved the lamp with new cable which is flexible even in very cold weather so that it is comfortable to be used by the miners especially for the miners of the cold weather. In 2010 we improved the lamp with the most advanced LED light of 150lumens with perfect light. The KL5M LED Li-ion Cap Lamp has set a new standard in reliability and safety for miner's cap lamps.

NOTE: we have patent of the lamp design, the patent No. is ZL 2006 3 0176325.1

**Product Features:**

**Safety:** Contained in a sealed battery case, the product has a short-circuit protection, LED light head lamp and anti-static housing which make it explosion proof. The miner's lamp is CE Certified for use in explosive atmospheres such as coal mines.

**Reliability:** Tough housing, optimized design, a solid LED light that uses high efficient IC drivers to guarantee the product is durable and strong. The durable Li-ion battery has an over charge protection system to protect the battery from over charging. The cap lamp is suitable for operation under harsh mining conditions.

**Portability:** Small in size, light in weight, ergonomically designed, maintenance free, simple charging, easy operation. The cap lamp has received praise from many miners and major mining companies.

**Efficiency:** LED light provides bright, clear, white light. The minimum luminous intensity is 7000-11000lux (at a distance of 1m). The quality of the light is maintained throughout the entire discharge cycle which lasts up to 15 hours. The battery has a life cycle of 1200 charges and discharges.

**Environmental:** The cap lamp is made from environmentally friendly Li-ion battery and other non hazardous materials. The KL5M is an environmentally friendly product as per RoHS Directive.

**Economy:** The cap lamp incorporates an environmentally friendly LiMn2O4 battery as a power source. The light is an efficient, high powered LED with a service life of over 30,000 hours. With no need to replace incandescent globes the KL5M eliminates the cost of labor and replacement parts associated with traditional lead acid batteries.

**Technical Parameter and Specifications:**

Features	KL5M Specifications
Rated capability	7.8Ah (Li-ion battery)
Rated voltage	3.8V
Continuous discharging time	15h (12-20h)
Main light LED Working voltage	3.3V
Main light LED Working current	0.37A (0.35-0.38A)
Main light Power	1W
Main light Luminous flux	150Lm (120-150Lm)
Lamp lighting degree Initial Lighting degree	10000Lux (11000-7000Lux) (distance in 1 m)
Lamp lighting Lighting degree in 11 hours	10000Lux (11000-7000Lux) (distance in 1 m)
Main light Usage life hour	>30000h
Accessory light Power	0.4W
Accessory light Usage life hour	>20000h
Short circuit protect time	<320μS
Usage duration of battery (recharges)	1200 recharges (in reasonable working condition)
Charging time	6h-8h
Dimensions	78 x 31 x 79mm (size of the Li-ion battery)
Weight	0.6kg

**NWB-15 Portable Charger**

The NWB-15 Portable Charger is a desk top charger specifically suited for the NEW WISDOM KL5M LED Li-ion Cap Lamp. The charger provides the user with the ability to charge the cap lamp from a standard power outlet. It is small in size, light in weight, and convenient to carry. The newly designed NWB-15 Portable Charger is more reliable than previous models and has a simple, sleek finish. The circuit board design has been optimized and improved to increase safety and reliability. The charger's shell is made from high quality aluminum alloy. The NWB-15 is CE Certified for European Union standards. In 2008 Nov. we have improved the portable charger combined with 85-265V/AC and 6-30V/DC charging function. Customers also can have the charger with 85-265V/AC charging function only.

NWB-15



**Usage Guide:**

1. The charger is compatible with most standard power outlets; the charger is supplied with an input voltage of 85- 265V and a frequency range of 50-60Hz. You also can have the additional charging function of 6-30V/DC in this same charger.
2. Outlet plugs can be supplied for US, EU, UK and AU standards.
3. Connect the outlet plug to the power outlet; the charger indicator light will turn green to indicate the presence of power.
4. Place the cap lamp head into the plug of the charger; turn 180 degrees clockwise until the anode touch the charger's cathode; and the charger indicator light will turn red to indicate it is charging.
5. Once charging is completed the charger indicator light will turn green. The charging time is approximately 6-12 hours.

**Maintenance:**

The NWB-15 Portable Charger requires no maintenance if used correctly under standard operating conditions.

**Charging Theory:**

The Lithium-ion battery makes use of both constant current and constant voltage charging methods. The charging current is 1500mA  $\pm$ 150mA; voltage is 4.30V  $\pm$ 0.05V with an approximate charging time of 6-12 hours. The circuit is designed with a steady state charging and control system which automatically regulates the charging process. The circuit we design is near the theory charging for Li-ion battery. For a discharged battery a constant current charge is employed at 1500mA  $\pm$ 150mA (the charger indicator light is red). When the charging voltage reaches 4.30V, the battery switches to a constant voltage charge (at this point the battery is approximately 70% charged) and the current gradually decreases. When the battery is sufficiently charged it automatically cuts off the circuit to protect the battery from over charging (the charger indicator light is green).

**Note:** It is not necessary to wait until the battery is completely discharged before charging. Charging can be undertaken whilst the battery is at any capacity and it actually prolongs the life span of the battery if charging is completed prior to complete discharge.

**Technical Specifications:**

1. Input: 85-265V /AC, 50-60Hz, 1A  
Or 6-30V/DC, 2A
2. Output: 4.30  $\pm$ 0.05V /DC, 1500mA  $\pm$ 150mA
3. Size: 125 x 55 x 80mm; weight: 0.3kg
4. Plug: US, EU, UK or AU standards for different markets.

NWB-15



CE Certification KL5M

**Bontek Compliance Laboratory**

### CE Certification of Conformity

Certification number: BCT0603065      Report number: BCT0603065  
Bontek Compliance Laboratory Ltd hereby declares that testing has been completed and reports have been generated for:

**Applicant:** NEW WISDOM INVESTMENT LIMITED  
4-206, Xianglinmiao, Hongli West Road, Shenzhen, China

**Manufacturer:** NEW WISDOM INVESTMENT LIMITED  
Building A1-4, Shenzhen Industry Park, Longgang District, Shenzhen, China

**Product:** Miner's cap lamp

**Model:** KL5M

**Power rating:** Input: 3.7VDC 0.35A

And, in accordance with the following Applicable Directives:

**94/90EC ATEX Manufacturers Directive (as amended)**  
Electrical and non-electrical equipment

That this product has been assessed against the following Applicable Standards:

**ATEX**      **EN 60079-0: 2004**      Electrical apparatus for explosive gas atmospheres - general requirements

Therefore, Bontek Compliance Laboratory Ltd hereby acknowledges that the applicant may issue a **DECLARATION OF CONFORMITY** and apply the CE marking in accordance with European Union Rules.

Attestation by:       

Address: He      Date of issue: November 1, 2006

No. 602-604, Jinnan Rd., Zhenyuan Rd., Zhenyuan Ln, Fubin, Shenzhen 518060, Guangdong, P. R. China  
Tel: 86-755-82871380    Fax: 86-755-82871389    Http://www.bontek.com.cn

**Bontek Compliance Laboratory**

### CE Certification of Conformity

Certification number: BCT0603070      Report number: BCT0603070  
Bontek Compliance Laboratory Ltd hereby declares that testing has been completed and reports have been generated for:

**Applicant:** NEW WISDOM INVESTMENT LIMITED  
4-206, Xianglinmiao, Hongli West Road, Shenzhen, China

**Manufacturer:** NEW WISDOM INVESTMENT LIMITED  
Building A1-4, Shenzhen Industry Park, Longgang District, Shenzhen, China

**Product:** Miner's cap lamp

**Model:** KL5M

**Power rating:** Input: 3.7VDC 0.35A

And, in accordance with the following Applicable Directives:

**94/90EC ATEX Manufacturers Directive (as amended)**  
Electrical and non-electrical equipment

That this product has been assessed against the following Applicable Standards:

**ATEX**      **EN 60079-1: 2002**      Cap lights for use in mines susceptible to flammable gases - construction and testing in relation to the risk of explosion

Therefore, Bontek Compliance Laboratory Ltd hereby acknowledges that the applicant may issue a **DECLARATION OF CONFORMITY** and apply the CE marking in accordance with European Union Rules.

Attestation by:       

Address: He      Date of issue: November 1, 2006

No. 602-604, Jinnan Rd., Zhenyuan Rd., Zhenyuan Ln, Fubin, Shenzhen 518060, Guangdong, P. R. China  
Tel: 86-755-82871380    Fax: 86-755-82871389    Http://www.bontek.com.cn

**Bontek Compliance Laboratory**

### CE Certification of Conformity

Certification number: BCT0603076      Report number: BCT0603076  
Bontek Compliance Laboratory Ltd hereby declares that testing has been completed and reports have been generated for:

**Applicant:** NEW WISDOM INVESTMENT LIMITED  
4-206, Xianglinmiao, Hongli West Road, Shenzhen, China

**Manufacturer:** NEW WISDOM INVESTMENT LIMITED  
Building A1-4, Shenzhen Industry Park, Longgang District, Shenzhen, China

**Product:** Miner's cap lamp

**Model:** KL5M

**Power rating:** Input: 3.7VDC 0.35A

And, in accordance with the following Applicable Directives:

**94/90EC ATEX Manufacturers Directive (as amended)**  
Electrical and non-electrical equipment

That this product has been assessed against the following Applicable Standards:

**ATEX**      **EN 50033: 1991**      Specifications for construction and testing of miners' cap lamps in relation to the risk of explosion, for mines susceptible to flammable gases

Therefore, Bontek Compliance Laboratory Ltd hereby acknowledges that the applicant may issue a **DECLARATION OF CONFORMITY** and apply the CE marking in accordance with European Union Rules.

Attestation by:       

Address: He      Date of issue: November 1, 2006

No. 602-604, Jinnan Rd., Zhenyuan Rd., Zhenyuan Ln, Fubin, Shenzhen 518060, Guangdong, P. R. China  
Tel: 86-755-82871380    Fax: 86-755-82871389    Http://www.bontek.com.cn

**Bontek Compliance Laboratory**

### CE Certification of Conformity

Certification number: BCT0603095      Report number: BCT0603095  
Bontek Compliance Laboratory Ltd hereby declares that testing has been completed and reports have been generated for:

**Applicant:** NEW WISDOM INVESTMENT LIMITED  
4-206, Xianglinmiao, Hongli West Road, Shenzhen, China

**Manufacturer:** NEW WISDOM INVESTMENT LIMITED  
Building A1-4, Shenzhen Industry Park, Longgang District, Shenzhen, China

**Product:** Miner's cap lamp

**Model:** KL5M

**Power rating:** Input: 3.7VDC 0.35A

And, in accordance with the following Applicable Directives:

**94/90EC ATEX Manufacturers Directive (as amended)**  
Electrical and non-electrical equipment

That this product has been assessed against the following Applicable Standards:

**ATEX**      **EN 56620: 2002**      Electrical apparatus for potentially explosive atmospheres - intrinsic safety "i"

Therefore, Bontek Compliance Laboratory Ltd hereby acknowledges that the applicant may issue a **DECLARATION OF CONFORMITY** and apply the CE marking in accordance with European Union Rules.

Attestation by:       

Address: He      Date of issue: November 1, 2006

No. 602-604, Jinnan Rd., Zhenyuan Rd., Zhenyuan Ln, Fubin, Shenzhen 518060, Guangdong, P. R. China  
Tel: 86-755-82871380    Fax: 86-755-82871389    Http://www.bontek.com.cn

CE Certification NWB-15 (GWB-15)

