Intrinsically safe miner's lamp

Intrinsically Safe Miner's Lamp

KL4LM(A)

操作手册
Operation Manual

淮南万泰电子股份有限公司
Huainan Wantai Electric Co., Ltd
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第一章 关于本手册

Chapter One About the Manual
第一节 开始工作前

The First Quarter  Before Work

1. 可采用的操作手册

1. Correct operation manual

请注意供您使用的本操作手册的适用产品范围，对比本手册所列数据是否与设备铭牌上的数据相符合。

Please pay attention to the scope of application of this manual for your use, and compare the data listed in this manual with the data on the nameplate of the equipment.

1.1 操作手册的实用性

1. Practical applicability

所有工作人员在任何时候都要熟悉设备操作手册的内容，这是期无例外和绝对必要的。

It’s absolutely necessary that ALL staff need to be familiar with the contents in this starter operation manual at any time.

1.2 本操作手册的适用对象

1.2 Application of this manual

设备的操作人员是本操作手册的适用对象，在工作面内的每一个人都必须阅读本操作手册。

The operators of this equipment are absolutely necessary to read this manual including:

- 运输人员;
- 组装/拆卸工;
- 操作工;
- 进行工作面日常例行工作;
- 维护工;
- 检修工;
- 指导人员 — 讲授和/或指导上述工作的。

- Transportation workers
- Assemble/Disassemble workers
- Operators
- Routine work
- Maintenance people
- Repairmen
- Guidance personnel

2. 本操作手册的目的

2. Purpose of this manual

2.1 问题

2.1 Questions
如果有任何问题，请与淮南万泰电子股份有限公司销售部联系。

For any question please contact with our International Trade Department+86-554-4333789

2.2 安全

2.2 Security

特别注意阅读“个人安全”一章，该部分包含了可能发生危险的重要资料。阅读本操作手册中的资料，并遵守手册中的指南。

Read the manual and comply with the guidelines.

3.字符和图标

3. Character and icon

安全指南所采用的下列字符和图标是操作手册中的重要资料。记住标志的形状和意义。

The characters and the icon in the Safety guidelines are important materials of this operation manual. Remember the shapes and meanings of signs below.

Dangerous！

在以此图标标记的操作手册中，有接近危险的地方，可能的影响是：非常严重的伤害或死亡。

In the operating manual marked by this icon is the place where is close to danger, possible effect is: very serious injury or death.

Warning！

标有这个图标的地方提供了危险状况的信息。可能的后果是：非常严重的伤害甚至死亡。

In the operating manual marked by this icon gives out useful information of possible danger, possible effect is: very serious injury or death.

Caution！

标有这个图标的地方是要您注意危险状况。可能的后果是：轻度或中度伤害和设备损坏。

In the operating manual marked by this icon is the place where remind you of danger, possible effects is: Mild or moderate seriously injured and damage of equipment.
Attention!

In the operating manual marked by this icon is the place where remind you of harmful condition. Possible effect is: damage transport facilities or adjacent equipment.

Important!

In the operating manual marked by this icon is to provide you operation hints and materials, not about harmful or dangerous situation warning.

Places with icons of hands often come along with series of certain operations. Following paragraphs will give out instructions. Please operate the starter step-by-step as instructions.
本章包括个人安全的重要资料。请特别注意这一章。安全指南和规则是为了保护您避免危险状况，帮助您尽可能安全地工作。

This chapter includes important information on personal safety. Please pay special attention to this chapter. Safety guidelines and rules are designed to protect you from dangerous situations and to help you work as safely as possible.
1. Possible risks

The equipment manufactured is currently more advanced and conforms to the accepted standards. However, when you operate the device, there may still be some dangers, such as the failure of the device due to an unavoidable external impact, or the failure of the device.

2. Additional rules

In addition to this manual, rules and regulations on accident prevention implemented by the state must be complied with.

The First Quarter Operator

Using cautions for operators:

- The lack of parts of the miner's lamp is strictly prohibited to use
- It is strictly forbidden to smash the lamp and change the structure of the lamp
- Miner's lamp is strictly prohibited for other purposes, such as blasting
第二节  操作条件

设备是为矿山工程等含有爆炸性气体或粉尘环境而设计和制造的。只能按照本操作手册使用设备。不能明确按照操作手册规定使用的就是违反操作手册的使用，不容许使用设备。有关详细资料参看“注意事项”。由于违反本操作手册使用不当或维修不当由此造成的任何损失，我公司不承担责任。

The Second Quarter  Operating conditions

The equipment is designed and manufactured for the environment of explosive gas or dust for mining engineering, etc. Only use the equipment in accordance with this manual.

Any use that is not specified in the operation manual is contrary to the operation manual, and the use of the equipment is not allowed.

For more information, see "cautions". Our company is not liable for any loss caused by improper use or improper maintenance.

第三节  安全指南

1.  基本原则
1.1  常规
要集中精力工作。熟悉您自己的工作环境。

1.2  保护装备
穿戴工作服和佩带各种保护装备。
通知您的伙伴：
■ 您所在的确切地点；
■ 您正在做的工作；
■ 预计要工作多久。

1.3  先决条件
只有在安全、正常情况下才能使用，使用前要检查设备功能是否正常。

1.4  电压结构
内部采用最高电压4.2V的可充电锂电池。
The Third Quarter  Safety guidelines

1. Basic principles

1.1 Routine
Focus on your work. Be familiar with your work environment

1.2 Protective equipment
Wear overalls and wear various protective equipment
Inform your partner:
■ The exact place where you are
■ What you are doing
■ How long it is expected to work

1.3 Prerequisites
It can only be used in a safe and normal condition, and check the function of the equipment before use

1.4 Voltage structure
Using rechargeable lithium battery of which the highest voltage is 4.2V

第三章  储存和运输

Chapte Three  Storage and Transportation

本章包括正确储存与运输设备的重要资料

This chapter includes important information on proper storage and transportation.

按照本操作手册提示去做，将会增加设备的寿命和利用率，也可使您的运输工作进行得更快捷和更安全。

According to the operation manual, it will increase the life and utilization of the equipment, and also make your transportation work faster and safer.
第一阶段 存储

The First Quarter  Storage

1. 暴晒在阳光下
1. Exposure to the sun

防止设备长期暴晒在阳光下。以防温度过高造成电气绝缘材料提前老化。

Prevent the long-term exposure of equipment in the sun. In case the temperature is too high, the

2. 潮湿和污垢
2. Moisture and dirt

矿灯应贮存在环境温度 0 至 30° C，干燥，清洁，通风良好，不腐蚀介质的仓库。

A miner's lamp should be stored at ambient temperature 0 to 30 °C, dry, clean, well ventilated, no corrosive medium in the warehouse.

3. 质量信息反馈
3. Quality information feedback

在使用一段时间后必须进行一次随机质量反馈，以确定设备的质量性能。

After a period of time, a random quality feedback must be carried out to determine the quality

performance of the equipment.

4. 长期储存
4. Long-term storage

长期储存时应每隔 2 个月对矿灯进行一次充满电和放完电，然后再冲 4h 后保存。再次使用时应对电气

性能进行检测，合格后方可使用。

The miner's lamp should be fully charged and discharged once every 2 months for a long period

of storage, and then stored after 4h flushing. The electrical performance should be checked again

after use, and can be used after qualified.

第二阶段 运输

The Second Quarter  Transportation

1. 运载设备
1. Transport vehicle

向用户咨询并考虑到当地的主要条件。
Consult the user and take into account the local conditions.

2. Transport safety devices and transport vehicle

In order to ensure the safety of the transport, the loose parts on each transport carrier must be tightened to prevent the accidental movement of its position and protect the outer shell of the whole equipment, glass and so on.

Additional transportation safety equipment is used in plastic bags, rain cloth and so on to prevent the equipment from dampness.

### 第四章 关于设备

**Chapter Four  About the Equipment**

This chapter provides comprehensive information on operations and maintenance of equipment, which can be used as preparation for training, and recommends reading this chapter, but must also be trained.

**Warning!**

Ignoring safety rules will lead to an accident that can cause serious bodily injury or death. The safety regulations of the mine shall be strictly enforced. The following additional guidelines are adopted and are consistent with the safety regulations of the mine. Special attention: In the operation, maintenance or repair process, the resulting loss due to destroying or replacing the controlled components of the model specifications and change the intrinsically safe parameters...
(for intrinsically safe products), our company does not assume responsibility.

### 第一节 概述

**The First Quarter Overview**

1. **用途**
   1. **Use**

   本安型矿灯KL4LM（A），本产品为便携式照明工具，主要适用于煤矿井下照明，也可适用于隧道，高空及野外作业等。

   Intrinsically safe miner's lamp KL4LM（A）, this product is a portable lighting tool, mainly used in coal mine underground lighting, but also can be applied to the tunnel, high altitude and field operations, etc.

2. **特点**
   2. **Features**

   采用LED为主光源，在矿灯寿命周期内不需要更换光源，同时，由于采用金属灯杯散热性能好，光源工作温度低、寿命长、安全可靠。

   Adopting LED as the main light source, it is not necessary to change the light source in the life cycle of the lamp. At the same time, due to the metal cup, it has good heat dissipation performance, low working temperature, long service life, safe and reliable features.

   采用新型充放电保护板，可防止过充过放，有效提高电池寿命。当发生短路时可迅速切断电源，故障排除后即可恢复工作，保证使用安全。

   A new type of charge and discharge protection board can be used to prevent overcharging and overdischarge and effectively improve battery life. When short-circuit occurs, the power supply can be cut off quickly, and the work can be resumed after troubleshooting to ensure safe use.

3. **执行标准**
   3. **Implementation standards**

   MT/T1051-2007《矿灯用锂离子蓄电池》
   MT1162.4-2011《矿灯 第4部分：KL型矿灯》
   MT/T1092-2008《矿灯用LED及LED光源组技术条件》
   MT/T1051-2007《Li-ion battery for Miner's Lamp》
   MT1162.4-2011《Miner's Lamp Part 4: KL type Miner's Lamp》
   MT/T1092-2008《Specification for led and led light source sets for Miner's Lamp》
4. 使用方法和注意事项

4. Use methods and cautions

矿灯充电器的充电电压为 5V，充电电流为恒流 ≤900mA；

- The charging voltage of the lamp charger is 5V, and the charging current is no more than 900mA.

矿灯房领到矿灯后应对新矿灯进行 14h 充电，然后放电 11h，没有出现异常，再次充电 11h 后就可下井使用。

- After the miner's lamp room received the miner's lamp, the new miner's lamp should be charged with 14h, and then discharge 11h, and no abnormality occurs. Then recharging for 11h, it can be used in the well.

充电须知：只须将灯头的充电插头孔，插到充电器的充电插头上，按顺时针旋转 180° 并接触好，此时充电指示器就发生变化（根据充电器而定），说明充电正常；

- Charging instructions: just insert the charging plug hole of the lamp holder into the charger plug of the charger, rotate clockwise 180 degrees and contact with each other, then the charging indicator changes (according to the charger), indicating the normal charging.

使用须知：矿灯灯头一侧为主辅光源的切换旋钮。通过旋动旋钮可以在主灯亮、关灯、辅灯亮、之间切换。为了延长亮灯的时间，尽量在非工作时间使用辅助光源。

- The switch knob of main light source is on the side of miner's lamp holder. Turn the knob to switch between the main light on, off, auxiliary light on. In order to extend the lighting time, try to use auxiliary light during non-working hours.

5. 使用环境

5. Using environment

5.1 适用于含有爆燃性气体环境（甲烷、煤尘）的煤矿井中；

- Suitable for coal mines containing explosive gas (methane, coal dust)

5.2 海拔不超过 2000 米，周围环境压力为 (0.8~1.1) x 10⁵Pa;

- The altitude is not more than 2000 meters and the ambient pressure is (0.8 ~ 1.1) x 105Pa

5.3 周围环境温度为 -20℃~ +40℃；

- Ambient temperature is 20 °C ~ + 40 °C

6. 型号组成及意义
6. Model composition and its representative significance

<table>
<thead>
<tr>
<th>K L 6 L M (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>设计修改序号</td>
</tr>
<tr>
<td>免维护</td>
</tr>
<tr>
<td>LED 光源</td>
</tr>
<tr>
<td>蓄电池额定容量</td>
</tr>
<tr>
<td>锂电池</td>
</tr>
<tr>
<td>矿灯</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>K L 4 L M (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design modification number</td>
</tr>
<tr>
<td>Maintenance free</td>
</tr>
<tr>
<td>LED light source</td>
</tr>
<tr>
<td>Battery rated capacity</td>
</tr>
<tr>
<td>Lithium battery</td>
</tr>
<tr>
<td>Miner's lamp</td>
</tr>
</tbody>
</table>

7. 防爆型式：本安型

7. Explosion-proof type: Intrinsically safe type

第二节 结构特征

The Second Quarter  Structural Features

产品由灯头，电缆及蓄电池和 ABS 阻燃外壳等部件组成，灯头内安装了 LED 光源，光源分为主光源和辅助光源，正常工作时使用主光源，主光源可连续工作 10 h 以上。

The product is composed of a lamp cap, cable and battery and ABS flame retardant shell and other parts, lamp installed in LED light source, light source composed of the main light source and the auxiliary light source. Use the main light source during normal use, can work continuously for more than 10h.

第三节 主要技术参数

The Third Quarter  Main Technical Parameters

<table>
<thead>
<tr>
<th>序号</th>
<th>项目</th>
<th>规格</th>
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<tbody>
<tr>
<td>1</td>
<td>开关形式</td>
<td>旋钮开关</td>
</tr>
<tr>
<td>2</td>
<td>额定电压</td>
<td>3. 7 V</td>
</tr>
<tr>
<td>3</td>
<td>额定容量</td>
<td>6Ah（锂电池）</td>
</tr>
<tr>
<td>4</td>
<td>点灯时间</td>
<td>≥11h</td>
</tr>
<tr>
<td></td>
<td>Item</td>
<td>Specification</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Button form</td>
<td>Knob switch</td>
</tr>
<tr>
<td>2</td>
<td>Rated voltage</td>
<td>3.7 V</td>
</tr>
<tr>
<td>3</td>
<td>Rated capacity</td>
<td>4Ah (lithium battery)</td>
</tr>
<tr>
<td>4</td>
<td>Lighting time</td>
<td>≥11 h</td>
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<tr>
<td>5</td>
<td>LED Main light source</td>
<td>Rated voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rated current</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Center illuminance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Service life</td>
</tr>
<tr>
<td></td>
<td>LED Auxiliary light source</td>
<td>Rated voltage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rated current</td>
</tr>
<tr>
<td>6</td>
<td>Battery life</td>
<td>≥500 times (300 x 20h / 10)</td>
</tr>
<tr>
<td>7</td>
<td>Full light weight</td>
<td>0.55 kg</td>
</tr>
<tr>
<td>8</td>
<td>Max Dimension (Length×Width×Height)</td>
<td>68×30×116mm</td>
</tr>
</tbody>
</table>
第四节 维护与维修

The Four Quarter Maintenance

日常维护、保养

Routine maintenance

矿灯的维修维护充电工作必须在地面由专业人员进行

- The maintenance and charging of the lamp must be carried out by professionals on the ground.

- 本矿灯采用的是本安型电子保护装置，只能由厂家进行更换

- This lamp adopts the intrinsically safe electronic protection device, which can only be replaced by the manufacturer.

- 更换电缆时应采用相同型号规格且在安标有效期内的

- The same type of specification shall be adopted when replacing the cable and within the validity period of the standard.

- 矿灯若出现故障，上井后应立即维修，存在故障的矿灯严禁下井使用

- If the miner’s lamp is out of order, it should be repaired immediately on the ground, and faulty miner's lamp is strictly forbidden to be used in the well.

- 长期放置时应每隔2个月对矿灯进行一次充满电和放完电，然后再冲4h后保存。再次使用时应对电气性能进行检测，合格后方可使用

- For long-term placement, the lamp should be filled with electricity and power for at least once every 2 months. After that, it should be recharged for 4h, then it can be stored. The electrical property can be tested when used again, and can be used after qualified.

- 每半个月检测一次充电器的电压是否在指定范围内

- Check whether the voltage of the charger is within the specified range every half month

- 电池槽出现肿胀形现象应立即停止使用

- When the swelling phenomenon of the battery slot appears, it should stop using immediately.
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