ELM 01

ELECTROMAX

DESCRIPTION:

The mining lamps type ELM are EEx I lamp designed for working environment with potential explosive atmosphere (especially for coalmines) and is certified according EN 50033, EN 50014. These lamps are patented in Romania and all around the world. The lamp has two distinct parts: the battery and the cap lamp. The worker is not disturbed in his activity by the lamp because the battery can be attached to the belt and the cap lamp to the helmet. Proper choice of materials and good executions indicate this lamp to be used in very hard working environments. Normal degree of protection is 54, therefore it is protected against dust without pressure and omni directional water drops.

MODELS OF LAMPS:

Depend on the head type, the optional devices attached and the battery capacity:

BATTERY	Without emitter	With emitter
NiCd 5 Ah	ELM01-5A	
NiMh 7 Ah	ELM01-7A	
NiMh 9 Ah	ELM01-9A	ELM01/P

THE BATTERY :

The battery uses 3 dry cylindrical NiCd or NiMh cells, depending of the autonomy needed. This cells are assembled in to a polycarbonate case. We provide the lamp with protection against short-circuit, over charging, over current and thermo cut-off. These protections are placed inside the battery cover and battery case. There are also protections give by the software which controls the lamps. On the battery is a metal clamp which allows the attachment of the battery on the user belt.

TECHNICAL CHARACTERISTICS:

Number of NiCd or NiMh cells	3 pcs
Capacity	5, 7 or 9 Ah
Nominal voltage	3.6 V
Average life	1500 or 800 cycle

THE HEAD:

- Use 31 high intensity LED's
- Emax at 1 m in axes is minimum 600 lux
- The LED's are controlled by a microcontroller with the following functions
- Changes the luminous intensity of the lamps, by changing the number of LEDs in light. In this case, 3 levels are obtained:
- I. 12 LEDs
- II. 18 LEDs
- III. 31 LEDs
- For this we use a push button. For changing the light phase the user have to press the button for 1 second. When the button is realist the lamp will change the phase.

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- The current consumed from the battery is counted and after 80% of capacity use the lamp signal with all LEDs. In this moment the user have only 20% autonomy so is he need to stay longer underground he will have to change the light on a lower phase to consume less current. This is giving him longer autonomy.
- After autonomy is reach the head will be automatically turned OFF to prevent over discharging the battery
- Count the number of charging/discharging cycles and when the number of 800 cycles is reach the lamp signal each time when is disconnected from the charging unit. When this signal appears is time to change the battery because the autonomy can be lower.
- The LED's are focused by a matrix of lenses

AUTONOMY

Depend on the phase used:

Phase	ELM01-5A	ELM01-7A	ELM01-9A	ELM01/P
I	18 h	29 h	38 h	
II	11 h	18 h	24 h	
III	7 h	11 h	14.5 h	

CABLE

Is made from two cooper wires twist together around a rope. The rope is placed in the middle and is function is to take the traction efforts from the cable. The cable coat is made by silicon rubber, very flexible but also fireproof and fat acid proof.

EMITTER

Is an optional device which can by placed in the cover of the battery. This allow the detection of the miner underground even thought a wall of 25 m of coal or rock. Is very useful for the rescue team which will know exactly where to look for the miners, in case of accidents. The accuracy of the system is measured in centimeters and the chance of survival increase because of this small device. The current used by the emitter is only 20 mA so with a battery of 9 Ah the autonomy of this emitter is more that 7 days even after 10 hours of normal time work with the light ON at maximum phase. Each emitter work on different frequency so the miner can be identified. For detection the rescue team uses a special antenna.

DIMENSIONS

Height	90 mm
Width	130 mm
Thickness	46 mm
Cable	1100 mm
Cap lamp diameter	65 mm
Light opening	42 mm
WEIGHT	800-1000 g

CHARGING

Can be made with individual charger, in a charger rack made by Electromax or in the existing charger adapted for ELM type lamps. For charging it use the two terminals from the head of the lamp

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