

## MANUAL UNDERWATER LIGHTING GRALmarine Vpro

### THIS SET COMPRISSES OF:

- two arms with integrated rechargeable Li-ION batteries and LED heads, with balls
- base with video / photo camera mounting screw, with clamp to mount the arms
- battery charger

### Vpro:

- is a lamp system used as the main lighting source for photo and video shooting during recreational and technical diving
- construction:
  - arm body made of surface anodized aluminium
  - Batteries placed in the arms
  - magnetic switches (without a pass through the housing) allowing switching three LEDs in each arm, by rotating the ring at the lower part of each arm, the switches work in both ways, working in positions: off – 3 LED – off
  - base - the screw (in the set) allows fixing standard photo threads
  - the whole set has a slightly negative buoyancy - several dozen grams, allowing easy handling underwater
- Vpro, as the source of light, has three Cree XML-2 diodes per arm, with a color temperature of 5500 - 6000 K
- requires 12 – 16,8 V power supply, use of higher or lower voltage can damage the lamp head
- tested to a depth of 150 meters, 300 meters on request

### BATTERIES:

- consist of Li-ION battery cells which feature small size and high capacity
- has a low self-discharge level (approx. 4% / month)
- has an electronic protection against: short circuit, overcharge and over-discharge (excessive discharge causes switching off of the battery)
- does not require full discharge before recharging
- can be charged at any time and at any level of discharge

### TERMS OF ARMS WITH BATTERY AND CHARGER USE:

- store in a dry and ventilated location within a temperature range of -20°C to +50°C, keep away from excessive heat and humidity
- the charger is designed for indoor use, in sheltered conditions, it should not be placed or used in conditions of excessive heat or humidity, it should not be used with a damaged power cable
- charging must always be within a temperature range of 0°C to +40°C
- temperatures above +60°C may cause internal damage to the battery pack
- after storage below 0°C it is necessary to acclimatize the battery pack at the minimum +10°C for 4 - 5 hours before use
- charging a frozen battery may cause internal damage to the battery pack
- discharging (usage) of the battery may take place within a temperature range of 0°C to +60°C
- battery can be stored after charging to a level of 50 - 70% (longer storage of the discharged battery leads to its degradation)
- when storing the battery, charge it at least once every six months
- charge the battery only with the supplied charger
- it is normal for the charger to become warm during use
- always charge both arms at the same time

### PREPARATION THE SET TO USE:

- check the battery charge level before diving
- make sure that both outputs are protected by blind plugs and adequately tightened
- check whether both arms work properly by rotating the magnetic switch in lower part of the arms, remember not to leave them turned on for more than few seconds on the surface
- always have an alternative source of light (backup)

### MAINTENANCE AFTER DIVING:

- rinse the arms with fresh water
- dry the set
- the arms must be switched off upon storage and transportation, with switches secured by attached screws, to prevent accidental switching on
- clean regularly
- wipe the front surface of the arms with a soft, moist cloth; do not use alcohol-based detergents (these cause dulling and cracking of the resin)

# GRALmarine

## BATTERY CHARGING:

- make sure the kit is drained
- unscrew the blind plugs
- plug the charger into an AC terminal of 110 - 230 V
- green LEDs will appear on the charger
- insert the charger plugs into the outputs the arms with batteries, the LEDs will turn red and the charging process will start
- when the batteries are fully charged, the LEDs will turn green

## IT IS STRICTLY PROHIBITED TO:

- open the arms with battery packs
- open the charger
- alter in the construction of arms with battery packs and charger
- short-circuit the charger plugs or outputs on the arms
- throw or shake the arms
- place the arms and charger into a fire or to store near an excessive heat source
- connect to the outputs something other than original delivered charging connectors
- connect the charger to any other product than Vpro
- charge the Vpro with different charger than the one included in the set
- dive or immerse in water with open outputs, not secured by blind plugs
- dismount balls in the lower part of the arms – are integrated with arms, dismantling can cause flooding and damage to the arms

## IMPORTANT:

- periodically check the condition of the o-rings and thread of the blind plugs, lubricate with silicone grease or silicone with Teflon
- never leave the arms switched on or use above water: this can cause overheating, unsealing and damage to the arms
- to provide a sealed hermetic cover of the outputs, the blind plugs have to be inserted and tightened
- immersing or diving with not secured outputs can cause flooding and damage to the arms
- care for mechanical damage: distortion of the arms can cause flooding

## DEALING WITH USED AND DAMAGED EQUIPMENT:

Lighting gear used by divers can be recycled and freely returned to the dealer or manufacturer. Batteries are the main environmentally hazardous components. The other components such as aluminum and copper are a source of raw materials after recycling. For these reasons, diving equipment should not be disposed with general waste. In accordance with the law pertaining to the disposal of used electrical and electronic equipment:

Art. 73 - Any person disregarding the prohibitions of Art. 35, by not disposing [recyclable] equipment to the proper collecting entity, is subject to a fine.

Art. 74 - Any person disregarding the prohibitions of Art. 36, by disposing [recyclable] equipment with other waste, is subject to a fine.