

## TECHNICAL SPECIFICATIONS

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Photocell ref. HL 2-31

<b>Principle</b>	High frequency infra-red (50 KHz) Piloting by quartz Detection of signal by frequency comparison
<b>Distance for use</b>	20 Meters at 20° C 15 Meters at -20° C
<b>Min. distance between moving body and photocell</b>	30 cm
<b>Output impulse</b>	By optocouplers and working contact. Impulse adjustable from 1/100 sec. to 2 seconds
<b>Working temperature</b>	- 20°C to + 50°C
<b>Internal power</b>	3 batteries 1.5 V "Alkaline", Type AA or UM - 3
<b>External power</b>	6 – 12V DC, Max. current 100 mA
<b>Internal power reserve</b>	100 hours at 20°C
<b>LED Checks</b>	- State of batteries - Alignment
<b>Precision of repetitive impulsions</b>	+/- 0.02 ms
<b>Dimensions</b>	150 x 80 x 40 mm (6 x 3,1 x 1,5 inches)
<b>Weight (incl. batteries and reflector)</b>	500 gr (18 ounces)
<b>Mounting</b>	with supports ref. HL 4 or tripods (1/4 " camera thread)

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**Maintenance** Although this photocell is built to work in hard conditions, we advise you to open sometimes the aluminium cover and to let it dry when the photocell has been exposed to humidity.

**Special Note** In case you use an external power supply, we advise you to place, in any case, 3 internal batteries. These will insure the functioning of the photocell in case of current cut off or falling voltage.

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PROFESSIONAL TIMING

HL 2-31 PHOTOCCELL

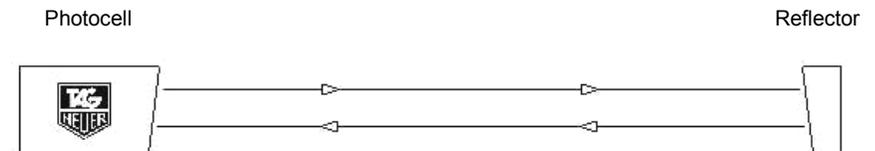
**USER'S MANUAL**

## DESCRIPTION

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Infra-red photocell with built-in power source and adjustment of duration of output impulse. This photocell offers exceptional quality for the price, satisfying the most exacting requirements of sports timing.

### Principle



The above photocell works perfectly with a distance between cell and reflector of up to 18m (58 ft.).

## OPERATING INSTRUCTIONS

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Switch on the photocell with ②

### a) **Battery check**

When you switch on the photocell, the LED ④ "BATT" illuminates briefly and goes out

- I New Batteries** ④ does not illuminate
- II Used batteries** ④ flashes slowly (once every 2 sec.).  
The batteries insure at least 30 hours of functioning at 20°C.
- III Flat batteries** ④ flashes rapidly (once every sec.).  
The batteries must be replaced. If this arises during the timekeeping the batteries will insure at least 6 hours of functioning at 20° C.

### **Warning**

Battery (hours of utilization) is very much reduced under 0° C and depends on their quality. We strongly recommend to use new batteries as soon as LED ④ flashes.

**b) Lining up the photocell**

When you switch on the photocell, the LED signal ⑤ illuminates and stays so as long as the photocell is **not** lined up with the reflector.

- First set up the reflector, perpendicular in relation to the cell.
- Then aim the cell at the reflector by using the sighting groove ①. You are in alignment when LED ⑤ is switched off and stays so even if you move slightly the photocell.
- Photocell and reflector must be steadily fixed on supports ref. HL 4 or on tripods.

When you cut the beam between the photocell and reflector, the LED ⑤ comes on. The output impulse is given at the output connections ⑦.

**c) Adjusting length of impulse ⑥**

Depending on the sport to be timed, it may be necessary to have a period of time in which the apparatus is blocked between the impulses in order to eliminate interference caused by the moving body.

Min. adjustment : Duration of impulse 1/100 sec.  
Max. adjustment : Duration of impulse 2 sec.

**d) Impulse outlets ⑦**

Open collector outlet - working contact  
Green terminal : Impulse  
Black terminal : Ground

**e) Changing the batteries**

Remove the screw underneath the case. Slide the electronic unit out of the case. Change the 3 batteries observing the polarities marked on the bottom. Be sure to use good quality Alkaline type 1.5 volt batteries (UCAR Energizer E-91 e.g.). Put the electronic unit back in the case and replace the screw carefully.

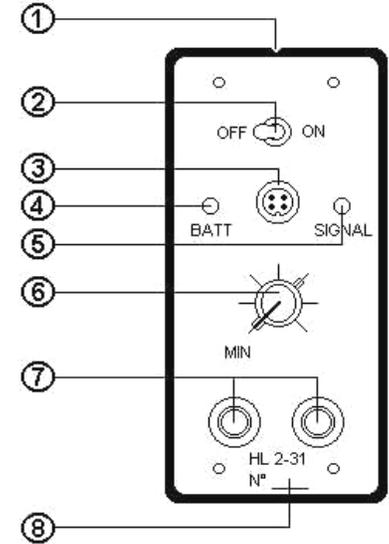
***Important***

If timing is interrupted for a long period or when it is finished :

**TURN BUTTON ② TO OFF POSITION**

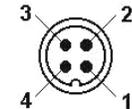
**HL 2-31**

- ① Sighting groove
- ② ON/OFF switch
- ③ External power supply
- ④ Battery check
- ⑤ Alignment check
- ⑥ Impulse length adjustment
- ⑦ Output jacks
- ⑧ Serial number



**Power connection scheme**

- ① Ground
- ② Impulse -
- ③ 6 – 12 V External Power
- ④ Impulse +



Cable to use : Ø of the sheath 3,5 to 4,5 mm (0,14 to 0,175 inch)