

Instructions for use

Hartenberger

UW-Strobe

125 digital

250 digital

625 digital



CONTENTS

SAFETY WARNING	2
GUARANTEE	2
APPLICATIONS	2
PRODUCT DESCRIPTION AND COMPONENTS.....	3
TECHNICAL SPECIFICATIONS	4
DIMENSIONS AND WEIGHT	5
PREPARATION FOR USE	9
USE OF THE STROBE	10
WARNINGS/ALARMS	15
AFTER USE	16
TRANSPORT	16
STORAGE	16
CHARGING	17
STROBE-ARM (OPTIONAL ACCESSORIES).....	20
CARE AND MAINTENANCE	21
FAULT DIAGNOSIS	22
ACCESSORIES.....	23
SPARE PARTS	23

Safety Warning

- **Before attempting to use the underwater strobe, these instructions for use should be carefully read and complied with.**
- **Before the first time the strobe is used, the cell pack must be charged.**
- **Do not operate the strobe immediately after charging.**
- **Always point the beam of the strobe away from yourself.**
- **Never point the strobe beam in the direction of another person.**

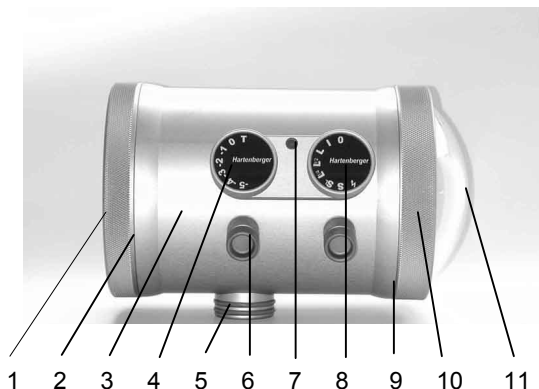
Guarantee

When these instructions for use and the care and maintenance guidelines are adhered to, we guarantee all mechanical parts made from steel, aluminium, glass and plastic for a period of 5 years against manufacturers defects and material failure. All electronic parts are guaranteed for a period of 1 year. The rechargeable cells and the charger have a guarantee against manufacturers defects and material failure for 6 months. The Halogen bulbs and O-Ring seals are expendable items and are therefore not covered by the guarantee. Any unauthorised work on the strobe, i.e. the removal or tightening of screws, or the removal of the guarantee seals, will make the guarantee void.

Applications

The **Hartenberger** Underwater Strobes are solely for use in underwater lighting applications. Use of the strobe in an environment other than fully submerged in water may cause the rechargeable cells to overheat which may result in the expected life of the cells being shortened.

Product description and components



HOUSING

- 1 Rear Ring
- 2 Rear O-Ring seal
- 3 Housing
- 4 Switch 2
- 5 Mounting
- 6 Synchronisation socket
- 7 LED-Indicator Red/Green
- 8 Switch 1
- 9 Front O-Ring seal
- 10 Front Ring
- 11 Dome Port

Illustration 1

FRONT RING

The front ring must be removed to replace the reflector or to replace the halogen bulb.

HOUSING/FRONT AND REAR SEALS

The housing is made from aluminium and is sealed with threaded rings at the front and rear which are sealed with blue Viton O-Rings
Dimensions (mm): 125 digital 78 x 2.5 50° shore hardness
250 digital 88 x 2.5 50° shore hardness
625 digital 88 x 2.5 50° shore hardness

REAR RING

The rear ring must be removed to access the rechargeable cell pack for charging.

SWITCH 1

Switch 1 is the mode selector for the strobe. Off / On / Pilot Light 100% / Pilot light 50% / Pilot light 25% / Slave with 100% Pilot light / Slave / SOS

SWITCH 2

Switch 2 is the power setting selector for manual applications and the selector for TTL

SYNCHRONISATION SOCKETS

The synchronisation sockets are for the synchronisation cable which connects the strobe to the camera.

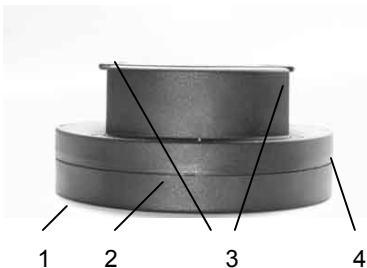
RED OR GREEN LED

The Green LED (appears yellow under water) indicates the strobe is ready to operate.

The Red LED indicates a warning or alarm (see page 15).

FRONT PORT

All strobes are fitted as standard with a convex dome port. The port corrects the refraction of light and maintains the correct beam.



POWER PACK

- 1 Sockets
- 2 Cell pack
- 3 Handle
- 4 Charging socket

Illustration 2

SOCKETS

This is the connection between the cell pack and the electronics.

CELL PACK

The rechargeable cells are housed in this pack.

CHARGING SOCKET

The plug from the charger is plugged into the charging socket for charging purposes.

HANDLE

Used to remove the power pack from the housing

TEST SWITCH (OPTIONAL, AVAILABLE SOON)

When pressed, activates the state of charge display

STATE OF CHARGE DISPLAY (OPTIONAL, AVAILABLE SOON)

The row of LED's indicates the state of charge of the cells.

Technical Specifications

APPROXIMATE LIGHT CODE NUMBERS (LZ) MEASURED ABOVE WATER WITH A STANDARD 90° REFLECTOR

	0	-1	-2	-3	-4	-5
125	LZ 16 1/3	LZ 11 1/3	LZ 8 1/3	LZ 5.6 1/3	LZ 4 1/3	LZ 2.8 1/3
250	LZ 22 1/3	LZ 16 1/3	LZ 11 1/3	LZ 8 1/3	LZ 5.6 1/3	LZ 4 1/3
625	LZ 32 2/3	LZ 22 2/3	LZ 16 2/3	LZ 11 2/3	LZ 8 2/3	LZ 5.6 2/3

The figures are reached within 1/250th second. This ensures full power even with short shutter speeds.

When using a 130° Flood-Reflector, the code number is reduced by approx. 1.

When using a 60° Spot-Reflector, the code number is increased by approx. 1.

The measurements above water are roughly equivalent to performance under water. The beam angle is slightly reduced under water, which increases the intensity of the light by approximately the same value as the light absorption factor in clear water.

APPROX. CELL DURATION WITH NICKEL METAL HYDRIDE CELLS

Model	Cell capacity	Full cycles	Pilot light 25/50/100% incl. 36 full cycles	
125	6V/3.0Ah NMH	200	10W	320/220/120 Min.
250	12V/3.0Ah NMH	200	20W	220/120/70 Min.
625	12V/3.0Ah NMH	85	20W	210/110/60 Min.

APPROX. CELL DURATION WITH NICKEL CADMIUM CELLS

Model	Cell capacity	Full cycles	Pilot light 25/50/100% incl. 36 full cycles	
125	6V/2.0Ah NC	190	10W	320/220/120 Min.
250	12V/2.0Ah NC	170	10W	210/110/65 Min.
625	12V/2.0Ah NC	80	20W	1900/95/50 Min.

(See also strobe recycle times page 13)

The ambient temperature has a large influence on the capacity of the cells. A water temperature between 4° and 6°c (40° - 45°f) reduces the capacity of the cells by approx. 20%.

New cells only reach their full capacity after 2-3 charge/discharge cycles.

The halogen bulbs available in retail stores may have up to a 10% higher rating than printed on the bulb. This can further reduce the cell duration.

Halogen bulb socket

The halogen bulb socket size is G4.

The bulbs supplied as standard have the following ratings: Model 125TTL 6V/10W, and Models 250TTL/625TTL 6V/20W

REFLECTOR BEAM ANGLE AND TEMPERATURE

The strobe is supplied as standard with a 90° beam angle reflector. 60° and 120° reflectors are available as optional extras.

The reflector can be equipped with various strobe tubes. Standard is a temperature of 5000°k (slightly warmer than daylight). 4000°, 4500° and 5500°k are available as optional extras. The temperature rating appears on the inside of the reflector.

Dimensions and weight

Model	Length x Diameter	Weight above water	Weight submerged
125	225mmx99mm	1.9kg	Approx. 0.10kg
	9" x 4"	4 lbs 3 oz.	Approx. 3½ oz
250	220x119	2.5kg	Approx. 0.05kg
	9" x 4½"	5 lbs 8 oz.	Approx. 2 oz
625	215x139(220+55x119)	3.0kg	Approx. 0.05kg
	8½" x 5½" (9" + 2" x 4½")	6 lbs 10 oz.	Approx. 2 oz

RESISTANCE TO WATER PRESSURE

We guarantee that all Hartenberger strobes are pressure proof to a depth well in excess of 100 meters (325 feet).

Front housing ring

WARNING!! SAFETY NOTICE:

Danger High Voltage!

Before opening the front housing ring, the strobe must be switched off. Leave the cell pack plugged in and wait at least 60 minutes before opening the housing.

REMOVING THE FRONT HOUSING RING.

The front housing ring is removed by unscrewing the ring anti-clockwise, (thread length approx. 10 mm [3/8"])

REFITTING THE FRONT HOUSING RING

Before refitting the front ring on the housing, all threads, sealing surfaces and seals must be checked for integrity and cleanliness.

If the O-Ring is removed, care must be taken not to damage the groove in which the O-Ring sits. A soft blunt tool should be used for the removal of the O-Ring, i.e. a wooden tooth pick.

Should the sealing surfaces and/or components be contaminated, then the O-Ring and its groove should be thoroughly cleaned and lubricated with a light coating of silicone grease. Should the sealing surfaces and/or components be damaged, then all damaged parts should be replaced. It is recommended that after such work has been carried out, the seal/integrity of the housing is first checked underwater without the cell pack fitted.

The front ring is screwed on clockwise and should be tightened only by hand. After the sealing surfaces have made contact, the ring will need to be tightened by hand approximately a further ¼ turn. The ring should be able to be opened again without undue force.

Reflector / Pilot Light

REFLECTOR REMOVAL

WARNING!! SAFETY NOTICE:

Danger High Voltage

(see warning for front housing ring)

PILOT LIGHT REMOVAL

After removing the reflector unit, the Pilot Light is easily accessible. Do not touch the glass of the halogen bulb with your fingers. This may result in the contamination of the bulb with residue from the fingers and may lead to a reduction of the performance of the bulb. Use a clean dry lint free cloth to grasp the bulb and pull it out of its socket. The replacement bulb can be pushed into the socket until a resistance is felt. The bulb should be sitting centrally in its socket to ensure that an even beam of light is produced. The correct function of the Pilot Light can be checked after the housing is closed.

Rear Housing Ring

UNSCREWING THE REAR HOUSING RING

The rear housing ring is removed by unscrewing the ring anti-clockwise, (thread length approx. 10 mm [3/8"]).

REFITTING THE REAR HOUSING RING

Before refitting the rear ring on the housing, all threads, sealing surfaces and seals must be checked for integrity and cleanliness.

If the O-Ring is removed, care must be taken not to damage the groove in which the O-Ring sits. A soft blunt tool should be used for the removal of the O-Ring, i.e. a wooden tooth pick.

Should the sealing surfaces and/or components be contaminated, then the O-Ring and its groove should be thoroughly cleaned and lubricated with a light coating of silicone grease. Should the sealing surfaces and/or components be damaged, then all damaged parts should be replaced. It is recommended that after such work has been carried out, that the seal/integrity of the housing is first checked underwater without the power pack fitted.

The rear ring is screwed on clockwise and should be tightened only by hand. After the sealing surfaces have made contact, the ring will need to be tightened by hand approximately a further ¼ turn. The thread should be able to be opened again without undue force

Cell Pack

REMOVING THE CELL PACK

After removing the rear housing ring, the cell pack can be pulled out using the integrated handle.

FITTING THE CELL PACK

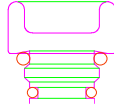
Hold the housing in a position where the opening is pointing slightly upwards, the power pack can now be slowly lowered into the housing. Once the locating pin is correctly mated with the socket, gently push the cell pack into the correct position. **Do not use excessive force!**

STATE OF CHARGE DISPLAY (AVAILABLE AS OPTION FROM 2001)

The state of charge of the cells can be seen by pressing the state of charge knob. The state of charge is represented by the row of LED's. (e.g. 2 LED's 20% charge, 8 LED's 80% charge) The state of charge can also be determined by a special setting of the switches. Switch 2 positioned at -4, and switch 1 to flash symbol. The number of flashes from the pilot light and the number of beeps heard, indicates the state of charge in the same way as the LED's. The calculation is made by the most modern micro processors. The available energy in the cells is exactly calculated from the number of exposures with the relevant power, the expired duration of pilot light use and setting and the natural self discharge since the last charge cycle. This function requires the use of the supplied original charger

Synchronisation sockets and cable

The strobes are equipped with 1 (a 2nd is optional) synchronisation socket. To protect the sockets from contamination and to keep them water tight during strobes use without a cable, they are equipped with a plug, sealed with 2 O Rings. The synchronisation cable connects the strobe with the camera.



- 1 Synchronisation Socket Plug
- 2 O-Ring 12 x 3.0
- 3 O-Ring 8 x 2.0

1 2 3

REMOVING THE SYNCHRONISATION SOCKET PLUG

To remove the plug from the socket, unscrew it anti-clockwise. The thread length is approx. 7 mm (¼").

FITTING THE SYNCHRONISATION SOCKET PLUG

Before refitting the plug, all threads, sealing surfaces and seals must be checked for integrity and cleanliness.

When the O-Ring is removed, care must be taken not to damage the groove in which the O-Ring sits. A soft blunt tool should be used for the removal of the O-Ring, i.e. a wooden tooth. (When the O Ring is squeezed around the circumference of the groove between finger and thumb, the tooth pick can be carefully placed under the loop which appears. Should the sealing surfaces and/or components be contaminated, then the O-Ring and its groove should be thoroughly cleaned and lubricated with a light coating of silicone grease. Should the sealing surfaces and/or components be damaged, then all damaged parts should be replaced. The plug is then screwed hand tight clockwise into the socket, (approx. ¼ turn after the shoulder of the socket contacts the upper O Ring) The plug should be able to be removed without excessive force or the necessity of tools.

CONNECTING THE SYNCHRONISATION CABLE

The cable is necessary for an electronic connection between the strobe and the camera. The supplied spiral cable has a synchronisation plug at each end. The plugs must be clean and dry when inserted and screwed in the sockets. They require regular care & maintenance. We recommend that the sockets are removed and cleaned at least every 1 – 2 weeks during extended use. Before the plugs are located in the sockets, all threads, sealing surfaces and seals must be checked for integrity and cleanliness.

When the O-Ring is removed, care must be taken not to damage the groove in which the O-Ring sits. A soft blunt tool should be used for the removal of the O-Ring, i.e. a wooden tooth. (When the O Ring is squeezed around the circumference of the groove between finger and thumb, the tooth pick can be carefully placed under the loop which appears. Should the sealing surfaces and/or components be contaminated, then the O-Ring and its groove should be thoroughly cleaned and lubricated with a light coating of silicone grease. Should the sealing surfaces and/or components be damaged, then all damaged parts should be replaced.

The synchronisation plugs consist of a contact plug with a water

proof cable connection, a threaded ring which screws in the socket, and a locking ring for securing the plug. The locking ring must be unscrewed (towards the cable) completely before fitting the synchronisation plug. If the ring is not unscrewed, the connection may not be water tight.

The contact plug has a locating nose to prevent it being incorrectly positioned. This locating nose must be lined up with the groove in the socket. The plug is then pushed into the socket (without excessive force) approx. 5mm (3/8") into the socket. Once the plug is located in the socket, the threaded ring is then screwed hand tight into the socket and finally the locking ring is screwed down hand tight, (approx. 1/4 turn after the shoulder of the socket contacts the O Ring) Both the threaded components should be able to be removed without excessive force or the necessity of tools.

Warning ! The plug should not feel loose in the socket when gently pulling or turning them. If this is the case, unscrew the locking ring, check that the plug is correctly located and the threaded ring is fully screwed into the socket.

To connect the other end of the cable to the camera, repeat the above process.

Preparation for use

BEFORE THE STROBE IS USED FOR THE FIRST TIME

Before the first use, the cells must be charged. (See Charging page 17)

Hartenberger underwater strobes are manufactured to a high degree of precision and each strobe is tested to a water pressure of 10 bars (330 ft.). The condition of the strobe and in particular the housing and sealing rings should however be checked before the first use. As a safety precaution, we recommend that the first underwater use be conducted without the power pack to check the seal of the housing.

BEFORE EACH USE

The rechargeable cells will naturally slowly discharge when not in use, (depending on the ambient temperature up to 60% discharge in one month!). We recommend therefore that the cells are charged one day before each use.

Before each use, the front and rear threads, sealing surfaces and O-Ring must be checked for integrity and cleanliness. (See Page 6). If the pilot light bulb has been removed for transport, it should be refitted into the socket.

Check that the strobe is correctly connected to the camera (see page 8). We recommend that the strobe is fired twice (see below) by the camera in the TTL mode to test the connection.

Warning ! Do not look directly into the beam or point the beam towards another person.

1. Firstly with the beam pointing directly into the lens of the camera, this will produce a weak flash.
2. Secondly, covering the lens (protective cap), this will produce a strong flash and activate the under exposure warnings. (If the strobe functions as described above, the TTL is working correctly).

Use of the Strobe

ELECTRONICS

Because the electronics are controlled by a micro processor, a wide range of control and monitoring functions are available.

SWITCH 1

Switch 1 selects the main functions of the strobe. The switches are illuminated and the settings can be seen even in zero ambient light conditions.

- 0** Off
 - a. If a picture is taken without first turning on the strobe and assuming the strobe has the power pack correctly fitted, a warning will be activated: 3 long flashes from the pilot light and a peep tone.
- I** On without Pilot light
- L** On with 100% Pilot light
- L 1/2** On with 50% Pilot light
- L 1/4** On with 25% Pilot light
 - Using the pilot light with reduced power saves energy and increases the burn time of the pilot light. The power setting is equivalent to the % value on the switch. However, if the pilot light is permanently used at a reduced setting, the bulb glass will develop a grey coating. For permanent reduced power settings, we recommend a bulb with a lower rating.
- SL** Slave with 100% Pilot light
 - In this mode, the strobe is activated by a light impulse from another strobe.
 - (In this mode, the strobe cannot be activated via the cable).
 - A special feature is the ability for the slave strobe to match the TTL synchronisation. (see page 11).
- S** Slave without Pilot light
- ↗** In this position, (↗) the strobe generates an automatic signal. The type of signal is selected on switch 2 as follows

SELECTION OF AUTOMATIC SIGNAL WHEN SWITCH 1 IS POSITIONED AT ↗

TTL SOS-Pilot light 3 x short - 3x long - 3x short

0 Strobe flash every 60 seconds, full power

-1 Strobe flash every 30 seconds, at -1 power

-2 Strobe flash every 15 seconds, at -2 power

-3 Strobe flash every 30 seconds, at -3 power

-4 SOS-Strobe 3 x short - 3x long - 3x short

-5 SOS-Strobe 3 x short - 3x long - 3x short (low power)

Immediately after selecting this mode, the strobe will start generating the signal selected.

- **Warning!**
 - Do not look directly in the reflector!!**
 - The SOS signal is only for use in emergencies. As soon as the SOS signal becomes weaker, switch off the signal. (when the cells are almost discharged). When assistance is in sight, then turn on the signal to attract attention. The time the pilot light SOS signal will operate is approximately 3 times longer than the burn time of the bulb fitted.**

SWITCH 2

Switch 2 selects either:

a TTL mode where the camera controls the amount of light the strobe emits
or the strength of the strobe in the manual exposure setting

1. **TTL** Automatic Strobe control via the camera.
2. **0** Full Power
3. **-1** minus 1 f-stop (1/2 power)
4. **-2** minus 2 f-stops (1/4 power)
5. **-3** minus 3 f-stops (1/8 power)
6. **-4** minus 4 f-stops (1/16 power)
7. **-5** minus 5 f-stops (1/32 power)
8. **TTL2** Automatic Strobe control with low power needs, (only Model 625 digital, see page 11)

MANUAL EXPOSURE WITH THE STROBE

The amount of light from the strobe, can be manually set at 6 different power settings, each of which is in steps in 1 f-stop. This means, the amount of light is halved for each subsequent setting. (1/1 1/2 1/4 1/8 1/16 1/32). For simplicity, the switch is scaled in a power reduction of f-stops (0, -1, -2, -3, -4, -5,)

The resulting power is listed in the technical specifications table on page 4.

TTL STROBE CONTROL

TTL stands for: "Through The Lens".

This function can be explained as follows:

When the photographer has pressed the shutter release, the shutter opens and exposes the film to light. As soon as the shutter is opened, the strobe receives a signal from the camera to fire the strobe via the electronics. The strobe tube begins to illuminate in a very short time. The light produced by the strobe hits the target subject and is reflected via the lens into the camera and onto the film. A sensor in the camera, measures this light, and as soon as enough light has been received by the film, the sensor sends a signal to turn off the strobe. The shutter subsequently closes.

A special technical feature of the strobe is the extremely short illumination time of the strobe tube.

This is necessary due to certain NIKON cameras (i.e. F5, F100, F90...) These cameras require the entire illumination within 1/500th second for a correct exposure.

If a correct exposure requires an illumination longer than 1/500th of a second, the camera will not emit the correct TTL cut off signal. This results in the remaining energy generating an uncontrolled overexposure of the film.

- **Special features of the 625 digital TTL**

TTL MODE WITH SHORT STROBE EXPOSURES

The entire electronic process of monitoring and controlling the amount of light which is required for a correct exposure is influenced

by a natural delay. This delay, thanks to the modern electronics is only about 1 microsecond, which is equivalent to 0.1% of the illumination time at full power. The strobe tube has a unavoidable and natural rest illumination, after the power has been cut, and this equates to approx. 10 times the electronic control time, which can under certain circumstances effect the exposure of the film.

In practice, this means:

At full power (100%), the rest illumination is approx. 1% of the desired illumination, this has little or no effect on the exposure.

Even at 50%/25%/12.5%/6.25%, the rest illumination remains at approx. 1% of the desired time and has little or no influence on the exposure.

However, where little light is required in TTL mode, the rest illumination may be even larger than the manual illumination at -5 setting! In this situation (3.125%), the rest illumination will have an effect on the exposure and may cause an over exposure of the film of approx. 1/3 f-stop. If the required light is further reduced by 1/2, the over exposure will be approx. 2/3 f-stop, having a great effect on the resulting picture.

Even original system strobes from the camera manufacturers have a tendency to overexpose the film in low illumination TTL circumstances (wide aperture).

The more powerful the strobe, the greater the rest illumination and danger of over exposure in low power circumstances.

Professional photographers compensate for this effect by using the +/- control and setting for an underexposure, however this requires a great deal of experience.

In practice, this means:

Pictures taken with open apertures tend naturally to be over exposed.

Thanks to special electronic circuitry, we have been able to extend the illumination time for low power requirements, this in turn makes the rest illumination factor irrelevant.

For this mode, the LH switch is turned to T2.

- **Warning!! Do not look directly in the strobe tube or reflector!!**

The strobe will generate 4 flashes to dissipate the rest energy in the electronics.

In the T2 Setting, there are approx. 150Ws of remaining energy stored in the strobe.

We recommend that the strobe is used in the normal TTL mode. If the strobe emits an over exposure alarm, (acoustic signal, red LED & long pilot light flash), then switch the strobe over to T2 mode.

If the illumination is insufficient in the T2 mode, an underexposure alarm is generated, (6 x fast beeper, flashing red LED & pilot light).

SLAVE / MANUAL

This position allows the strobe to be used as a secondary strobe in cable-less slave mode. The strobe is activated by a light impulse from another (master) strobe. The amount of light the strobe generates is set on the power selector (switch 2).

After the strobe is correctly fired in the slave mode, a signal from the pilot light and beeper will be generated for approx. 2 seconds.

In the mode with the switch in the Slave position, the strobe cannot be activated via the cable from a camera. Use of the camera in this mode may result in warnings (as in „Off“ position) See page 10.

SLAVE / TTL

A special feature is the TTL slave mode. For this mode, the power switch of the slave strobe is set to TTL. The illumination time (power) that the slave strobe produces will be matched to the light from the master strobe. If both strobes have compatible strobe tubes, then the light will be exactly matched. This reliable feature is an electronic „trick“. The slave strobe waits until the master strobe has turned off, the exact illumination time is calculated and the slave strobe produces a flash for exactly this duration. The measurement is not influenced by any reflection from suspended particles which may be present. A pre-requirement of a correctly exposed picture is that the correction setting on the camera (+/-) is set to -1 f-stop.

After the strobe is correctly fired in the TTL slave mode, a signal from the pilot light and beeper will be generated for approx. 2 seconds.

If the strobe produces a full power flash, then the under exposed warning may be heard/seen from the pilot light, red LED and beeper.

STROBE RECYCLE TIMES (THE TIME IT TAKES FOR THE STROBE TO CHARGE ITSELF READY FOR THE NEXT FRAME)

The fast recycle times (the time it takes for the strobe to charge itself ready for the next frame) in partial power settings allow up to 10 frames per second to be correctly exposed!

To achieve the fastest recycle times in the full power mode (0.8 seconds with the model 625), Nickel Cadmium (NC) Cells must be used. The amount of exposures possible at full power is then only 10% less than with the more powerful Nickel Metal Hydride (NMH)cells.

To enable a full 36 frame film to be exposed at full power and have the maximum burn time of the pilot light, the NMH cells must be used.

This is a result of the efficiency the different cells in different applications.

The inverter for charging the strobes condensers makes the following recycle times possible.

Model	NC-Cells	NMH-Cells
125 TTL	0.3 Sec.	0.5 Sec.
250 TTL	0.3 Sec.	0.5 Sec.
625 TTL	0.8 Sec.	1.2 Sec.

This results in the possibility to fire 36 frames at full power in a very short time. **We recommend however that due to the danger of the strobe tube being over loaded (the electrodes and the glass of the tube will be red hot!) this practice is only used in very special circumstances.**

The cells will also be discharged at an extreme rate over their recommended limits and the life of the cells will be reduced.

LOW CAPACITY WARNING

When the cells reach their low capacity level, the following warnings are generated:

1. Pilot light blinks constantly
2. Red/Green LED blink constantly
3. Constant short beeper sounds

By switching off the strobe and then (after waiting min. 1 second) switching it back on again, 5 remaining frames can be shot using full power (proportionally more frames if partial power is required/selected).

To prevent unnecessary load on the cells, we recommend that the strobe is not used after the low capacity warning is generated. The sooner the strobe is switched off, the longer the life expectancy of the cells.

DISCHARGE PROTECTION

If the strobe is further used, the discharge protection will deactivate all the strobe's functions with the exception (for safety reasons) of the pilot light at 25%. The switch lighting blinks alternatively with the red LED. After a few minutes, the discharge protection warning will appear (constant blinking of the pilot light). Shortly after this warning, all electronics will be deactivated. A 3 second beeper will sound, and all displays will be turned off.

As soon as the discharge protection warning appears (continuous blinking of the pilot light bulb), the strobe should be switched off as soon as possible and switched back on again until the cells are recharged.

LEAK DETECTOR

In case water enters the housing of the strobe, the condensers will discharge themselves (for safety reasons) by generating flash (es). The inverter will be deactivated and the following warnings will appear. All LED's will blink red, the beeper will emit a continuous acoustic signal. The signal can only be deactivated by removed the cell pack. If however the leak is extensive, the warnings may also fail.

- **The strobe should not be used again!!**

Warnings/Alarms

The various optical signals, alarms and warnings are listed in the table below.

Cause	Pilot light	Switch lighting	LED red/green	Beeper
Strobe not switched on and shutter release	3 x slow flashes			3 x long
Strobe On		on		
Strobe ready		on	Green (u/w yellow)	1 x short
Under exposure warning TTL & Slave TTL Modes	6 x short off or on	on	6 x fast red blinks	6 x short
Under exposure warning (only model 625 in TTL)	1 x long off or on	on	1 x long red blink	1 x long
Switch 1 SOS Switch 2 TTL (inverter deactivated)	3 x short, 3 x long, 3 x short,	on		
Cells at low capacity The warning ends when the strobe is switched off. After waiting min. 1 second and then switching the strobe back on, 5 full power exposures are possible.	Cont. short flashing	on	Continuous red & green blinking	Short and cont.
Low charge discharge protection. (no exposures possible, only pilot light at 25%, then flashing at 25%)		Cont. flashing	Cont. Red blinking	
Cells discharged	Off	Off	Off	1 x approx. 3 Sec long.
Water Leakage	Cont. flashing	Cont. flashing	Cont. Red blinking	Cont. short

- Short signals approx. ½ second.
- Long signals approx. 1½ seconds.

After Use

After use, check the housing for any signs of leakage. If a leak is detected, see fault diagnosis on page 22.

After use in salt water, the entire strobe should be thoroughly rinsed and soaked in clean, fresh water. The strobe should be completely submerged in fresh water, simply hosing the housing down is not sufficient. To wash the salt deposits from the sealing areas, the switches should be moved to all positions. The joints of the strobe arm should be removed and rinsed.

If a neoprene sleeve is used, this must be removed after the dive to allow the housing to dry. A housing that is wet for an extended period of time, will be susceptible to catalytic corrosion which may weaken the bonded joints.

Remove and charge the cells as soon as possible after use. Even partially discharged cells should be charged after use.

Transport

When transporting the strobe, the cell pack should be removed from the housing to prevent the strobe from being switched on inadvertently.

Storage

The strobe arm joints should be dismantled, and cleaned. Grease the threads before reassembling the joints.

Store the strobe at a temperature between 15° - 25°C (60° -75° F) with fully charged cells fitted and the housing closed. Under no circumstances should the ambient temperature exceed 40°C (105°F). The NMH-cells are subject to a natural discharge over time, (depending on the temperature; up to 60% in 1 month!). We recommend that the cells are charged once a Month. The strobe's condenser should also be exercised once a Month as follows: Switch on the strobe with fully charged cells and allow approx. 5 flashes to be generated with switch 2 in pos. **O** and switch 1 in **SOS**.

- **Warning! Do not look directly in the reflector!!**

For longer storage, remove the cell pack from the housing and store it cool and dry on a resistant working surface. Look out for signs of corrosion or oxidation, (floury deposits around the housing or corrosion on the sockets/pins). If these are found, do not use the cell pack and send it to the manufacturer.

Charging

INTRODUCTION IN THE CHARGING OF NICKEL CADMIUM CELLS

Nickel Cadmium and Nickel Metal Hydride cells are generally described as being gas and acid sealed cells. The position of the cells during the charging process is therefore irrelevant as no electrolyte can escape. There is however no supplier of cells that will guarantee this feature for the entire life of the cells! During the charging or discharging process, the cells may produce an over pressure inside, opening the integrated over pressure relief valve. Should this occur, the electrolyte, or Hydrogen can escape from the cells. Because the electrolyte is a very aggressive acid, and additionally conducts electricity, this may lead to the galvanic corrosion of the cells, and a destruction as a result of the contact with the acid. The escaping hydrogen can combine with oxygen in the air and form a highly explosive gas. A single cell the size of a standard D cell battery can produce up to 25 litres, (1 cu ft) of gas! It is for this reason that Nickel Cadmium Cells and Nickel Metal Hydride Cells should always be removed from a housing before they are recharged. Only then is the safe use and longest possible life of the cells guaranteed.

MEMORY EFFECT

The so called Memory Effect is the common term for the reduction in the capacity of the cells as a result of charging the cells in a partially discharged condition. (e.g. A wireless telephone hand set has a battery life of 24 hours, but is replaced on the station and therefore charged after 3 hours). The common technique for overcoming this is to fully discharge the cells before charging.

We regard this as being more harmful for underwater strobes and strobes with between 5 and 10 cells. The constant discharge down to the cut-off voltage limit can overload individual cells and disrupt the balance within the matched cell pack. This may result in an individual cell "dropping out".

We recommend that for every 10 to 20 cycles where the cells are partially discharged, that the strobe is fully discharged until the built in discharge protection turns the strobe off. **The more often the cells are taken to their minimum capacity, the higher the strain on the individual cells**

PREPARATION FOR CHARGING

For the charging procedure you will need a clean working area with be a mains socket nearby. Charge the cells in an environment which is as dry and clean as possible, with a resistant work surface. (Sealed cells can also leak under poor conditions). The ambient temperature should not exceed 45°C (110°F). The power pack must be removed for charging. (See Page 4).

USE OF NON ORIGINAL CELLS AND/OR CHARGERS

Cells or chargers which are not original Hartenberger parts or accessories must be checked by the manufacturer before using them with the strobe. Unauthorised use renders the guarantee void.

OFF SHORE I/6 CHARGER

This charger utilises the latest in electronic charger technology with a wide range input voltage (100v - 250v) with frequencies of between 45 - 65 Hz. (There is no need to manually select the input voltage).

All **Hartenberger** power packs with 5 and 6 cells (Nickel Cadmium or Nickel Metal Hydride) will be automatically recognised by the charger, and charged as fast as possible. The charging current can reach 0.9 amps.

The charger cable should first be plugged into the charging socket.

The charger is activated by plugging it into the mains supply. (There are adapters for the most common types of mains plugs which can be easily slotted onto the charger).

All the functions of the charger are monitored via a LED.

Signal from the LED

- Red Input voltage is present, the charger is functioning properly.
- Blinks Red The cells are fully charged and maintained with a trickle charge.
- Blinks Red fast The cells are fully discharged (starting regeneration).
- Out No mains voltage present.

Do not use overdue force when fitting the plug into the socket. Avoid any chance of short circuiting the contacts of the plug or the power pack.

The charger has an integrated mechanism protecting it against overheating and large fluctuations in mains voltage. Should the protection cut in, the charging process will be interrupted. After the mains plug has been removed from the mains socket for a few minutes, the charger will then be ready for use again. Care must be taken to achieve adequate cooling in extreme environments.

- **Do not operate the strobe immediately after the charging cycle is completed. Do not point the strobe-light at yourself or in the direction of other persons.**

MAXIMUM CHARGING TIMES USING AN OFF-SHORE I CHARGER FOR FULLY DISCHARGED CELLS

Strobe-Type	Voltage/Capacity <i>charging time</i>	Voltage/Capacity <i>charging time</i>
125	6V/3.0Ah NMH 3.5 hrs	6V/2.4Ah NC 2.5 hrs

OFF SHORE II CHARGER 250TTL/625 TTL (OPTIONAL 125TTL)

This charger utilises the latest in electronic charger technology with a wide range input voltage (110v - 250v) with frequencies of between 45 - 65 Hz. (There is no need to manually select the input voltage). All Hartenberger power packs with between 5 and 12 cells will be automatically recognised by the charger, and charged as fast as possible. The charging current can reach 2.0 amps.

The function of the charger is monitored via 2 light emitting diodes (LED's) with varying colours and flashes. The charger is activated by plugging it into the mains supply.

LED I

- Green Input voltage is present, the charger is functioning properly.
- Red Input voltage is present, the charger is overloaded or defective.
- Out No input voltage present.

The charger cable should now be plugged into the charging socket in the power pack. **Do not use overdue force when fitting the plug into the socket. Avoid any chance of short circuiting the contacts of the plug or the power pack.**

LED II

- Red No Cells are connected (interruption).
- Green blinking Rapid charge up to approx. 95% of capacity.
- Green Trickle charge with a reduced current.
- Out Maintenance charge, Cells are fully charged.

All the functions of the charger are monitored by a controller in the charger. This monitoring has a time lag when the function of the charger changes, and may lead to a slight delay in the LED's reacting, (1-5 seconds).

The charger has an integrated mechanism protecting it against overheating and large fluctuations in mains voltage (LED I turns red). Should the protection cut in, the charging process will be interrupted. After the mains plug has been removed from the mains socket for a few minutes, the charger will then be ready for use again. Care must be taken to achieve adequate cooling in extreme environments.

- **Do not point the strobe at yourself or in the direction of other persons Do not operate the strobe immediately after the charging cycle is.**

MAXIMUM CELLS CHARGING TIMES USING AN OFF-SHORE II CHARGER FOR FULLY DISCHARGED CELLS

Strobe-Type	<i>Voltage/Capacity charging time</i>		<i>Voltage/Capacity charging time</i>	
125	6V/3.0Ah NMH	2.0 hrs	6V/2.4Ah NMH	1.5 hrs
250	12V/3.0Ah NMH	2.0 hrs	12V/2.4Ah NMH	1.5 hrs
625	12V/3.0Ah NMH	2.0 hrs	12V/2.4Ah NMH	1.5 hrs

Strobe-arm (optional Accessories)

The professional strobe arm is manufactured using stainless steel tubing diameter 18mm (approx. 3/4 "). The arms weighs approx. 300 g (10½ oz.) in water.

The off-shore strobe arm is manufactured using Aluminium-Tubing diameter 43mm (approx. 1 5/8"). The arm is neutral in water.

The strobe arms are made up of the following sub-assemblies:

1. T-Bracket with arm base.
2. Double clamp strobe arm joint
3. Strobe arm extension
4. Clamp mount for strobe

T-BRACKET

Slide the T Bracket fully on to the T mount on the camera housing. First screw down the centre hand screw lightly hand tight. To prevent the arm moving sideways and therefore causing the central screw to loosen, screw the side hand screw hand tight. The screws must be able to be unscrewed without excessive force or the use of tools. The strobe arm base is approx. 28 cm (11") long and fixed at an approx. Angle of 45° to the T Bracket.

DOUBLE CLAMP STROBE ARM JOINT

The double clamps have the following components: A Cylinder with a threaded stainless steel rod onto which there are 2 levers. The lever can be lifted away to allow them to turn without screwing the thread. Up to 3 O-Rings per clamp can be fitted to the cylinder. The number of O-Rings will influence the level of friction of the joint. When the clamps are screwed down, the joints are fixed with the maximum grip.

STROBE ARM EXTENSION

The maximum working radius of the strobe arm is reached with the strobe arm extension. The standard arm is 35 cm (approx. 14") long. Special lengths are available on request, however the min. length is when the strobe is swing around and would lie in the centre of the lens port.

The longer the arm extension, the greater the leverage at the joints.

CLAMP MOUNT FOR STROBE

The stainless steel bolts are screwed into the strobe mount. Before the supplied locking nuts are screwed on, the bolts should be unscrewed approx. 3mm (1/8")

Warning ! The bolts should not make contact with the blind end of the thread !

The O-Rings fitted to the mount will influence the amount of friction on the joint. When the clamp is screwed down, the joint is fixed with the maximum grip.

CARE & MAINTENANCE

All stainless steel threads should be regularly lubricated with silicone grease. The plastic and stainless steel components of the lever assemblies are toothed. This allows the lever to be lifted away to allow them to turn to a desired position without screwing the thread/adjusting the friction set. These components must be thoroughly rinsed after use to remove any sand and salt deposits.

Care and Maintenance

HOUSING

We recommend that from time to time the housing surface is impregnated with silicone . The chance of calcium depositing on the surface of the strobe is reduced and the scratch resistance properties of the housing surface are also improved.

Procedure	Frequency	User operation	Qualified Technician
Rinse the housing with clean fresh water	After each use in salt water	X	
Impregnate Housing surface with silicone grease Grease strobe arm threads	After 1-2 Weeks use or before storage	X	
Check the O-Rings and sealing surfaces for contamination and damage. If necessary clean, lubricate or replace	Each time the seal is opened	X	
Disconnect and examine the synchronisation plugs, sockets & cables. (clean/grease)	After 1-2 Weeks use or before storage	X	
Replace the rear housing O-Ring	Every 12-24 Months or after 100 dives	X	
Replace the front housing O-Ring	Every 12-24 Months or after 100 dives	X	
Replace the O-Rings in the Synchronisation plugs, sockets and cables.	Every 12-24 Months or after 100 dives	X	
Replace the Halogen Bulb	Service life approx. 100 hrs.	X	
Replace the NMH cell pack	Service life up to approx. 300 charge cycles	X	
Replace the O-Rings on the strobe arm	Every 3-5 Years	X	
Replace the front port O-Ring	Every 3-5 Years		X
Replace the switch axis O-Rings	Every 3-5 Years		X

Fault Diagnosis

Problem	Cause	Action to be taken
<p>Water/Flooding</p> <ol style="list-style-type: none"> 1. in the synchronisation sockets. 2. A few drops in the cell pack compartment. 3. Cell pack compartment flooded with fresh water. 4. Housing flooded with fresh water <ol style="list-style-type: none"> 5. Cell pack compartment / Housing flooded with salt water 	<p>O-Ring or sealing surface damaged or contaminated</p>	<p>End the dive as soon as possible, open the housing.</p> <ol style="list-style-type: none"> 1. Blow the water out and dry thoroughly. 2. Dry the compartment with a cloth, dry the cell pack. Check the O-Ring seals. 3. Dry the compartment with a cloth, dry the cell pack. Send complete strobe to manufacturer. 4. Remove the reflector and stand the strobe up on front end to dry. Send complete strobe to manufacturer. 5. Rinse the effected area with fresh water and allow to dry. Send complete strobe to manufacturer.
<p>Pilot light does not function</p>	<ol style="list-style-type: none"> 1. Electronics require reset. 2. Cells are discharged 3. defective bulb 	<ol style="list-style-type: none"> 1. Perform reset (see table below) 2. Charge cells 3. Replace bulb
<p>Threaded components difficult to screw on/off</p>	<ol style="list-style-type: none"> 1. Threads dirty 2. Threads damaged 	<ol style="list-style-type: none"> 1. Clean and lubricate threads and O-Rings. 2. Send complete strobe to manufacturer
<p>Off shore I charger No LED</p> <p>LED blinks fast</p>	<ol style="list-style-type: none"> 1. Charge cable not plugged in 2. No mains power to charger 3. Loose contact on charge socket 4. Charge overloaded, safety circuits activated 	<ol style="list-style-type: none"> 1. Plug in charge cable 2. Check power supply 3. repeat plug in of socket 4. Isolate charger from power supply, wait min. 3 minutes before reconnecting. Ensure adequate cooling
<p>Off-shore II charger No LED 1</p> <p>LED I red</p>	<ol style="list-style-type: none"> 1. Charge cable not plugged in 2. No mains power to charger 3. Loose contact on charge socket 4. Charge overloaded, safety circuits activated 	<ol style="list-style-type: none"> 1. Plug in charge cable 2. Check power supply 3. repeat plug in of socket 4. Isolate charger from power supply min. 3 minutes before reconnecting. Ensure adequate cooling

PERFORM RESET 

If functional problems with the electronics are experienced, remove the cell pack for approx. 2 minutes, then refit the cell pack. This reset will resume the normal operation.

Accessories

REFLECTORS

To achieve a different beam angle and the reflector temperature, the complete reflector must be replaced.

A spot (approx. 60°) reflector and a wide angle (approx. 130°, available soon) reflector are available in the following colour temperatures: 5500K/5000K/4500K/4000K.

DIFFUSER (AVAILABLE SOON)

The diffuser is an opaque cover which can be mounted on the dome port. The diffuser has a diameter of approx. 140mm (5½").

The diffuser is for use in advanced macro photography and produces a softer illumination with softer shadows.

COLOUR FILTER(AVAILABLE SOON)

Filters in Pink, Red, Yellow, Green & Blue allow for more creative possibilities in under water photography.

PKW INVERTER 12 OR. 24V

The PKW Inverter is necessary to supply the charger if only 12v (or optional 24v) DC is available, (auto/marine applications)

Spare parts

O-Rings	125	250	625	Elasticity	Material
Dome Port	88x3.0	108x3.0	118x3.0	70° shore	Viton blue
Front Housing	78x2.5	78x2.5	88x2.5	50° shore	Viton blue
Rear Housing	78x2.5	78x2.5	88x2.5	50° shore	Viton blue
Sync. plugs	8x2	8x2	8x2	50° shore	Viton blue
Sync. plugs	12x3	12x3	12x3	50° shore	Viton blue
Strobe arm joints	32x3	32x3	32x3	50° shore	Viton blue
Dimensions in mm!					
Halogen Bulb	Model 125	Socket G4	6V 10 W	6V 20 W	
Halogen Bulb	Model 250/625	Socket G4	6V 10 W	6V 20 W	

Issue Dec.2001 Rights reserved for technical changes All forms of Reproduction forbidden.

Hartenberger

Unterwassertechnische Geräte GmbH
Rennebergstr. 19 D - 50939 Köln
Tel.:0221-415000 Fax.: 0221-415050
info@hartenberger.de
www.hartenberger.de