

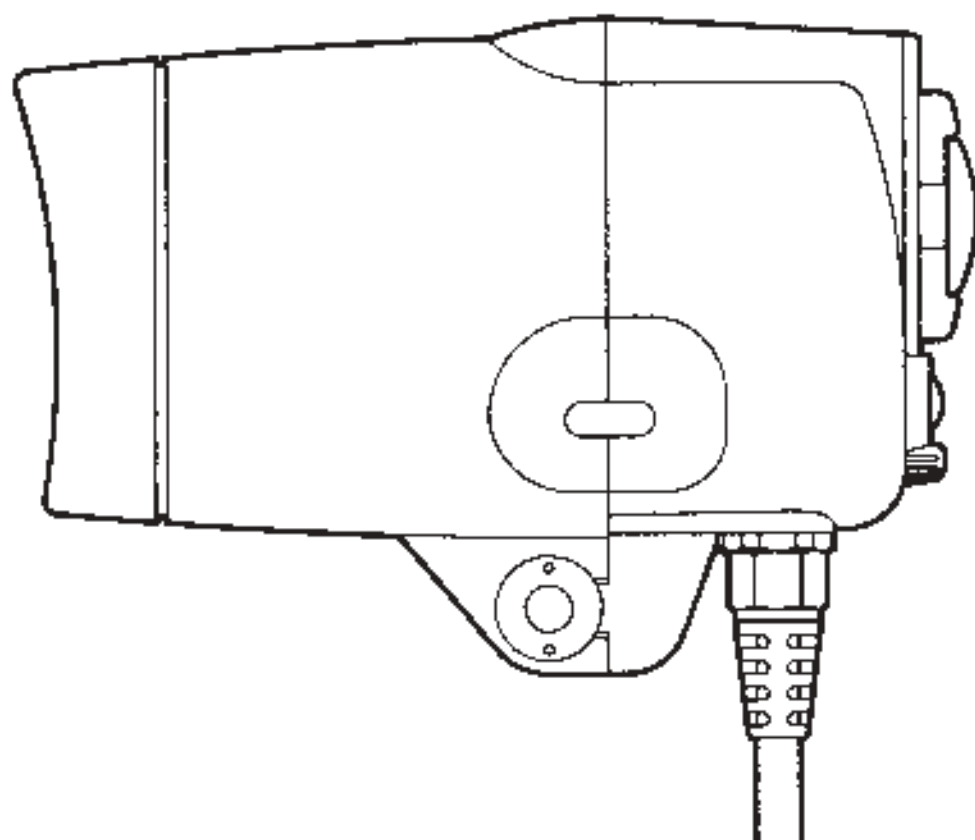
SEA&SEA



UNDERWATER TTL STROBE

YS-60 TTL/S
YS-60 TTL/N

INSTRUCTION



—Yellow Sub—

YS-60 TTL/S

YS-60 TTL/N

Thank you and congratulations on your purchase of SEA & SEA's YS-60TTL-S/N Strobe. For proficient operation of all strobe functions and to maximize performance, please read this manual thoroughly before use. Retain for future reference.

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Safety Precautions

For proper operation of this housing, please read the following safety precautions before use. Improper use or handling could cause equipment malfunction.

Please read carefully those precautions designated "CAUTION!" Failure to heed can result in personal injury or property damage.

Safety Precautions for Operation of the Strobe

CAUTION!

- Use only manganese, Ni-Cd or alkaline batteries. Other batteries may emit hydrogen gas and possibly cause an explosion.
- Always make sure that the strobe and accessories are securely assembled to prevent them from falling off, becoming lost, causing personal injury or equipment malfunction.
- Do not attempt to disassemble the strobe. Internal high voltage circuitry can cause personal injury.
- Do not alter or modify the strobe. User modifications can result in flooding.
- If you detect smoke or an acrid odor, discontinue use immediately. Remove the batteries from the strobe. Send to an authorized Sea & Sea dealer.
- If the event of flooding, turn off strobe and camera. Discontinue use immediately. Remove batteries from camera and strobe.
- ※ Beware of increased pressure inside the strobe. Handle with extreme care when opening.
- ※ Bring to your authorized Sea & Sea dealer as soon as possible.
- Never use abrasives, alcohol or paint thinner to clean the strobe; they will scratch, mar and damage the surface.
- During transportation or when not in use for a long time, remove batteries to avoid unwanted battery consumption due to accidental activation of the power switch.
- Sea & Sea Products Ltd. will not be responsible for costs incurred for film and/or processing should malfunction of the YS-60TTL-S/N strobe, camera, strobe or accessories result in unsatisfactory photographs.

Safety Precautions for Storage of the Strobe

⚠ CAUTION!

- When not in use for a long period of time, remove batteries; possible battery leakage will cause malfunction.
- When not in use for a long period of time, attach to the camera and trigger the shutter release (film and batteries are unnecessary). This will exercise the internal parts and keep the strobe in good working condition.
- Do not store in a damp or humid environment.
- Do not store this product in extremely warm environments with front and rear cases sealed. Pressure build up cause mildew, rust, corrosion and other damage to the metal and rubber parts in this product.
- This product incorporates plastic parts. Do not subject this strobe to extreme heat, such as on a car dashboard, or in direct sunlight. Plastic parts are prone to warping.

Handling the O-ring

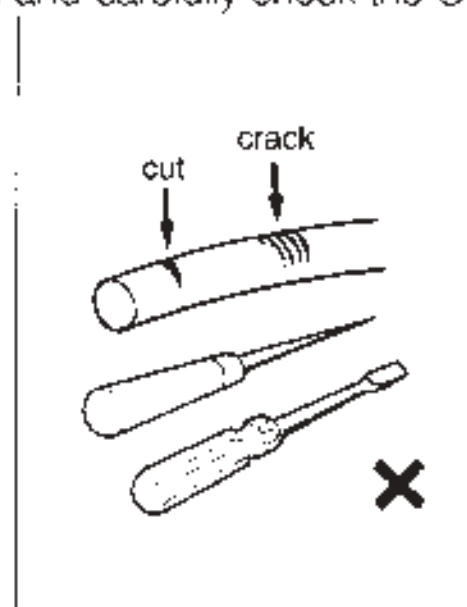
The O-ring in your YS-60TTL-S/N strobe provides an airtight, waterproof seal. Improper handling and maintenance of the O-ring can cause flooding. Please observe the following precautions carefully.

● Remove the O-ring for inspection.

Before use, remove the O-ring from its groove and carefully check the O-ring, O-ring groove and the O-ring contact surface. A thorough examination of the O-ring and the O-ring groove is not possible unless the O-ring has been removed.

● Always inspect the O-ring for scratches or cracks.

If the O-ring is damaged, it must be replaced. Never remove the O-ring with a sharp tool. To avoid damaging the O-ring, use a tool especially made for O-ring removal.



●Inspect for debris.

Make sure that there are no foreign particles, such as dust, sand or hair, on the O-ring, O-ring groove, or O-ring contact surface. Such contamination will breach the seal and cause flooding. If necessary, wash the O-ring thoroughly in fresh water and dry with a lint-free cloth. Use a cotton swab to clean the O-ring groove and contact surface.

●Lubricate with silicone grease.

Silicone grease protects the O-ring from drying and abrasion. Dab a small amount of grease onto your finger and draw the O-ring through your fingers until evenly coated. Use the silicone grease sparingly. Too much grease attracts debris.

●Do not crimp the O-ring.

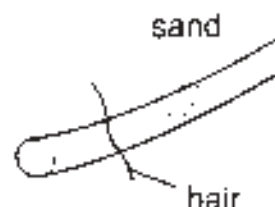
Hold the O-ring straight and do not bend or twist it when fitting it into the O-ring groove.

●O-ring storage.

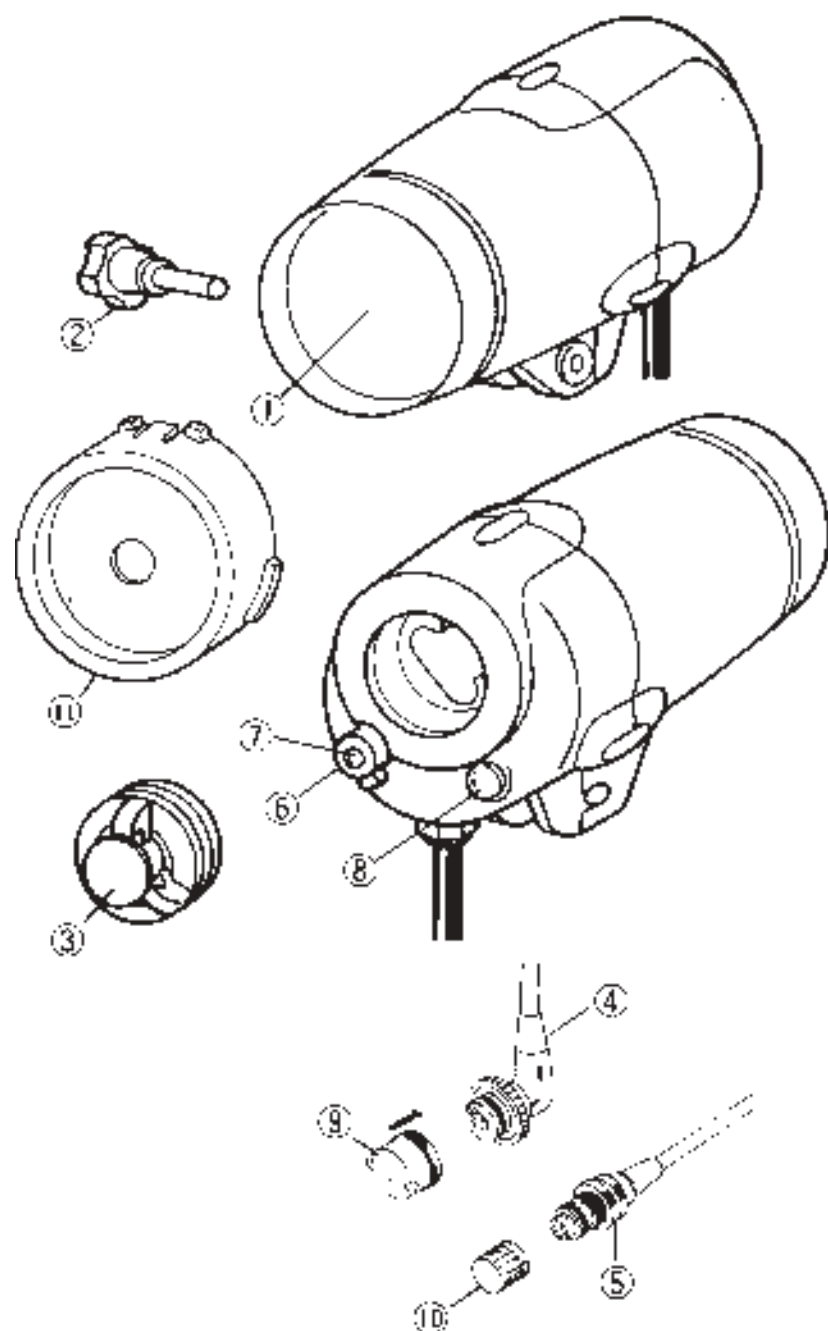
Always store your O-ring (and spare O-rings) in an airtight container and in a cool environment. Keep out of direct sunlight. Take care that it is stored flat and not bent or twisted. Do not place any heavy objects on it; excessive weight will flatten it and impede its sealing capability.

●The O-ring's life is one year.

The life of the O-ring depends on the diligence of your maintenance, frequency of use, and storage conditions, but on average, if you maintain your O-ring properly, it will retain its watertight integrity for one year.



Parts Identification



- ① Flash
- ② Arm Fixing Bolt
- ③ Battery Cap
- ④ Connector for Motor
Marine use
(60TTL/S)
- ⑤ Nikonos V Connector (60TTL/N)
- ⑥ Switch
- ⑦ Neon Lamp
- ⑧ TTL Lamp
- ⑨ Connector Cap
(for 60TTL/S)
- ⑩ Connector Cap
(for 60TTL/N)

Accessories



O-ring



Silicone
grease



4 SUM-3 (AA)
alkaline
batteries

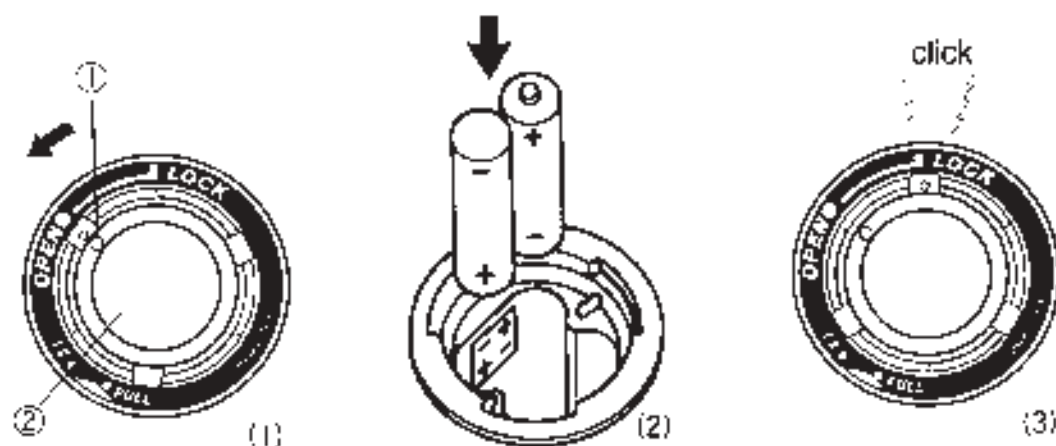
Before Photographing

Battery mounting

Battery types compatible with this unit are SUM-3 (AA) alkaline or nickel-cadmium (Ni-Cd).

Mounting and exchanging

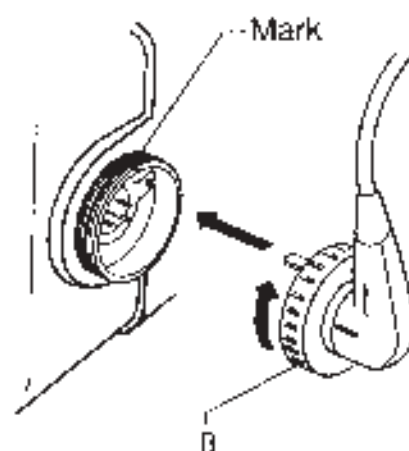
1. Turn ① counterclockwise to the OPEN position, and pull ② straight out. (Fig. 1)
2. Make sure that the switch is turned OFF, then put four batteries into position while confirming their $\oplus \ominus$ orientation as indicated. (Fig. 2)
3. Make sure that there is no dust or flaw on the battery cap's O-ring, and apply a bit of silicone grease over the O-ring. Align the positions of circles ① and ② with that of OPEN. After getting them together by inserting them straight, turn ① until it reaches the LOCK position and is fixed with a click. (Fig. 3)
4. When exchanging batteries, dry your hands and create a moisture-free environment. In particular, wipe any water drops from your hair and your wetsuit sleeves.
5. Be sure to use the same kind of batteries. Always exchange all four batteries at the same time.



Connection with the Camera

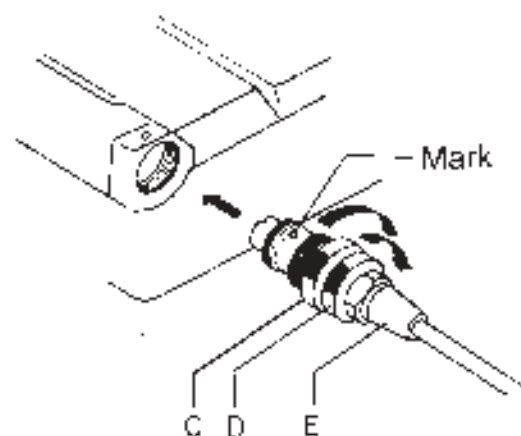
Y-60TTL/S

1. Make sure that there is no flaw or dust on the connector's O-ring, then apply a thin coat of silicone grease over it. O-ring needs to be removed before greasing.
2. Align the groove on the camera port with the Protrusion on the connector (4-hole) and fit them together by inserting straight into the port. Turn (B) so as to fit the screw on the camera until it comes to a stop, then fix it firmly.
3. To remove the connector, unfasten (B) and pull it straight out while firmly holding the base of the connector part. Never twist or pull the cord.



YS-60TTL/N

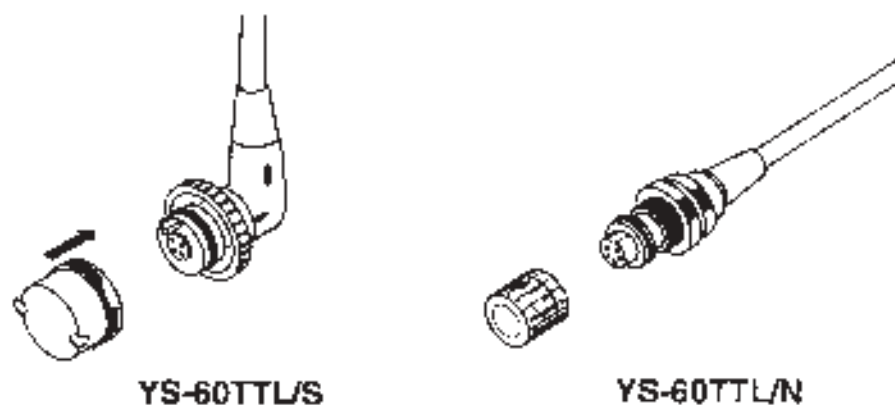
1. Make sure that there is no flaw or dust on the connector's O-ring, then apply a thin coat of silicone grease over it. See YS 50TTL/S
2. Align the circle mark on the camera with that on the connector (5-hole), and insert straight into the camera. Spin the lock ring (C) all the way back toward the cord.
3. Use (D) to screw the cord into the camera. Screw should be tightened firmly but not excessively tight.
4. Screw the lock ring (C) so that it is firmly against camera



5. TO remove the connector, reverse the procedure and pull (E) straight out. Never twist or pull the cord.

NOTE

- Do not touch the connector contacts with your fingers or allow silicone grease to adhere to the contacts. If you find silicone grease on it, clean with alcohol.
- When the cord is not attached to the camera, protect the contacts with the cord cap.
- To wash the camera with fresh water after removing the synchro cord, be sure to put the synchro cord cap on the connector.



How to Photograph

Depending upon your needs, you can select either full(on), TTL or 1/2 power on your YS-60TTL strobe.

Switch Manipulation

1/2 (Manual flash mode)

This setting is used for manual photography.

With this method, the unit flashes with a certain amount of light (GN11) by means of the camera's synchro switch. Determine your desired f stop according to the subjects distance, using the exposure calculation table below or calculating on your own.

A red light will come on when the strobe is ready to fire.

However, remember to calculate at 1/2 to 1/3 the land GN value because light absorption is exceptionally high underwater.

Values given in the exposure calculation table below are based on 1/2 (GN5.5). (Reference values)

TTL Automatic Light Adjusting Range (Reference Value)

Aperture (F-stop)	ISO Film Speed					TTL Range	
	400	200	100	50	25	m.	ft
	5.6	4	2.8			0.7~3.9	2.3~13
	8	5.6	4	2.8		0.5~2.7	1.6~9.0
	11	8	5.6	4	2.8	0.3~1.9	1.0~6.3
	16	11	8	5.6	4	0.3~1.3	1.0~4.3
	22	16	11	8	5.6	0.3~1.0	1.0~3.3
		22	16	11	8	0.3~0.6	1.0~2.0
			22	16	11	0.3~0.5	1.0~1.6

Under Water Exposure Table

*Use the values on the table as reference since the value is affected by visibility, water quality and floating particles in the water.

*It became the full light flashing mode and the TTL lamp does not light up when the light adjusting range is exceeded. Reset at a proper F stop value after conforming the relationship between photographing distance and F stop value.

Exposure Calculation Table (Reference Value)

Calculated with the guide number 11 (1/2 of FULL)

Photographing Distance (m)		ISO					Distance (ft)	
Full	1/2	25	50	100	200	400	Full	1/2
0.2		22					0.6	
0.3		16	22				1	
0.5	0.2	11	16	22			1.6	0.8
0.6	0.3	8	11	16	22		2	1
1	0.5	5.6	8	11	16	22	3.3	1.6
1.3	0.6	4	5.6	8	11	16	4.3	2
1.9	1	2.8	4	5.6	8	11	6.3	3.3
2.7	1.3		2.8	4	5.6	8	9	4.3
3.9	1.9			2.8	4	5.6	13	6.3
		Aperture (Iris Stop Value)						

*Use the values on the table as reference since the value is affected by visibility, water quality and floating particles in the water.

FULL (Manual flash mode)

This setting is used for manual photography.

With this method, the unit flashes with a certain amount of light (GN22) by means of the camera's synchro switch. Determine your desired f stop according to the subjects distance, using the exposure calculation table below or calculating on your own.

A red light will come on when the strobe is ready to fire.

However, remember to calculate at 1/2 to 1/3 the land GN value because light absorption is exceptionally high underwater.

Values given in the exposure calculation table below are based on 1/2 (GN11). (Reference values)

TTL (TTL light adjustment mode)

With the TTL mode, brightness of the subject to be photographed is measured by the camera, and the strobe unit controls the required amount of light so as to provide the proper exposure. Therefore, even if the object's distance changes, the amount of light can be automatically controlled to readily provide the proper exposure. Relationships between film sensitivity, shutter stop value and range under TTL light adjustment photography are given in the table below.

With TTL light adjustment photography, light adjustment can be confirmed with the TTL lamp. The lamp lights up for about three seconds if photography was performed within the range of light adjustment.

If exceeding the limit, the lamp does not light up, and the mode is switched to full flash. Therefore, if there is a possibility of under-exposure, confirm the relationship between the object's distance and shutter stop value, and reset to the proper stop value.

HOW TO FIND CORRECT f-STOP

$$F \text{ Stop Value} = \frac{\text{GN}}{\text{Photographing Distance}}$$

*When film sensitivity (ISO) is 100

NOTE Since light absorption under water is noticeable, calculate with a 1/2 to 1/3 value of GN value on the ground.

The guide number (GN) for a multiple photographing is obtainable by the following calculations.

$$\text{Multiple GN} = \sqrt{\text{GN}^2 + \text{GN}^2 + \dots}$$

DIFFUSER FOR YS-60TTL/S · YS-60TTL/N

Thank you very much for purchasing our diffuser.

This diffuser is specifically designed for YS-60 TTL/S and YS-60 TTL/N. This diffuser allows you underwater to cover the view angles of 16mm wide lens and 20mm wide lens for use with our Motor Marine Series, and of 15mm wide lens, 20mm wide lens and wide conversion lens for use with Nikonos.

Precautions in Handling

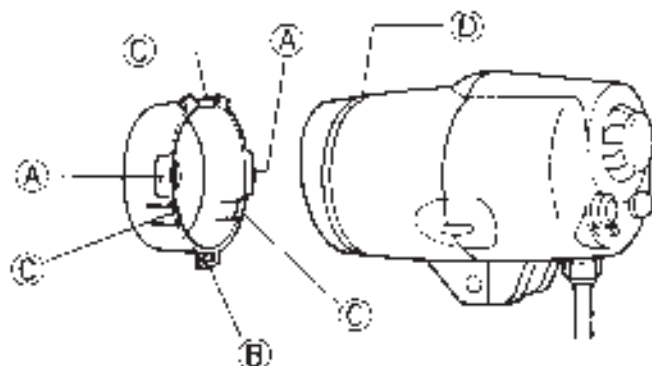
Do not leave the diffuser for a long time under direct sunlight or in places of high temperature.

If the diffuser has become dirty, wash it either with fresh water or neutral detergent, then wipe it with a soft cloth.

Never use a solvent like thinner, benzine or alcohol. After using the filter, wash it thoroughly with fresh water.

Attaching/Detaching the Diffuser

1. To attach the diffuser, pick up the diffuser at part A with your fingers and set it so that the three claws on the diffuser's part C fit into groove D on the strobe's main body.
 - * Make sure the diffuser is properly set in the groove of the strobe's main body. Improper setting can lead to damage or failure during use.
2. To detach it, take hold of the diffuser at part A with your fingers and remove the part C from groove D on the main body, pulling the diffuser one side at a time.
 - * To prevent the diffuser from falling off, the diffuser has a hole (B) so a strap can be put through it. We recommend that you use the diffuser with a suitable strap put through the hole.



Specifications

1. Illuminating angle: Approx. $105^{\circ} \times 105^{\circ}$, covering 15mm, 16mm and 20mm wide lenses.
2. Guide numbers: 16 for land value (in cases of full flash and ISO 100)
8 for land value (in cases of 1/2 flash and ISO 100)
3. Color temperature: $5100^{\circ}\text{K} \pm 300^{\circ}\text{K}$ (land value)
4. Compatible with: YS-60 TTL/S, YS-60 TTL/N

NOTE

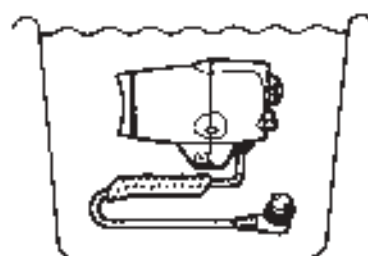
- With this diffuser, guide numbers are 16 for land use (in cases of full flash and ISO 100). Therefore, photograph with a lens opening greater by one scale than in ordinary photography.
- For underwater photography, pay attention to water transparency, quality of water, underwater floating matter, etc., since photography is affected by these factors.

Care and Storage after Photographing

1. After using this unit under water (particularly sea water), be sure to wash it thoroughly with fresh water. Be sure all caps are on connectors.
2. After washing with fresh water, wipe with a dry, soft cloth and dry in the shade.

NOTE Do not dry it forcibly with heating equipment such as a hair drier.

3. After using, remove batteries from the battery compartment. When removing them, wipe water away completely so that water drops will not get into the battery compartment. If water does get in, wipe away completely.
4. After use, apply a thin coat of silicone grease over the connector's O-ring, then put a cap on it.
5. When storing for a prolonged period of time, store with care, away from high temperature, high humidity, direct sunlight, or severe cold.



Specifications

	YS-60 TTL/S	YS-60 TTL/N
Guide number:	22 for land value in meter (in case of full flash and ISO 100) 11 for land value in meter (in case of 1/2 flash and ISO 100)	
Angle of coverage	Approx. 105 x 95, covering 15 mm wide lenses.	
Power source:	4 SUM-3 (AA) alkaline batteries or 4 nickel-cadmium batteries	
Flash frequency available:	200 times with alkaline batteries (on a full-flash basis) 120 times with nickel-cadmium batteries (on a full-flash basis)	
Recycling time:	6.5 sec. with alkaline batteries 4 sec. with nickel-cadmium batteries	
Color temperature: (land value)	5400°K ± 300°K / 5100°K ± 300°K with Diffuser	
In light adjustment mode:	TTL automatic light adjustment	
Light adjustment range (underwater):	0.5 to 3.9m (ISO 100)	
Water-pressure resistance:	60m (200 ft.)	
Size:	163 x 88 x 113mm	
Weight:	720g (less 110g underwater batteries contained)	760g (less 50g underwater batteries contained)
Accessories:	SUM-3 (AA) alkaline batteries 4 Arm Fixing Bolt 1 O-ring 2 Silicone grease 1 Diffuser 1 TTL RANGE CHART 1 EXPOSURE CALCULATION CHART 1	

All the performance capabilities listed in the above table of specifications are in terms of the normal temperature (25°C).

Data concerning nickel-cadmium batteries are reference values available from fully charged batteries with a claimed capacity of 500mAh.

Specifications and appearance of the product are subject to change without prior notice.