

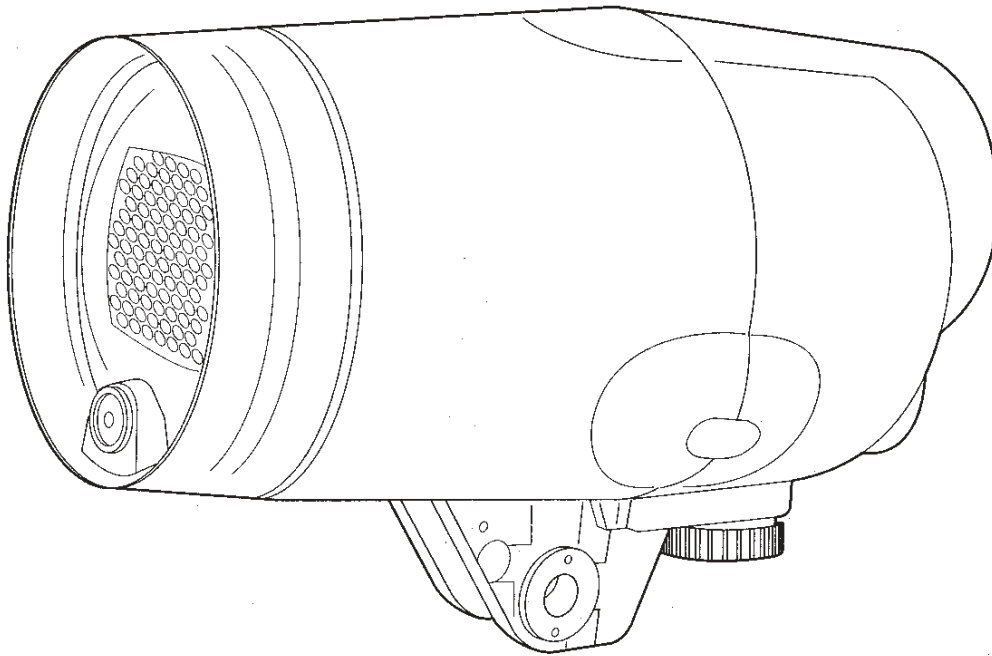
SEA&SEA

CE

UNDERWATER TTL/AUTO STROBE

YS-90AUTO

Instruction Manual



— Yellow Sub —

YS-90AUTO

Thank you and congratulations on your purchase of SEA & SEA's YS-90AUTO 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 safe handling of the product, please read the following precautions before use.

*Misuses listed under the following precautions could lead to serious consequences. Please observe the precautions as they contain highly important information related to personal and product safety.

Definitions:

- **⚠ WARNING!:** Situations that could result in serious injury or death.
- **⚠ CAUTION!:** Situations that could result in property damage or personal injury. Please read carefully since failure to heed these precautions could have serious consequences.

〈General Precautions for Operation of the Strobe〉

⚠ WARNING!

- Use only manganese, alkaline, lithium, Ni-MH or nickel-cadmium batteries rated 1000mA or less in this unit. Do not use any other type of battery. Doing so may generate a toxic gas.
- Do not fire this strobe with the reflector facing down on a table or the floor as that may cause overheating of the internal circuitry and/or fire.
- Do not trigger the strobe near combustible materials. It may cause fire.
- Heat from the batteries may cause pressure buildup inside the battery compartment. When opening the battery compartment, the battery cover may release with unexpected force. To avoid injury, open with extreme care.

⚠ CAUTION!

- Remove batteries from the strobe after use.
- Do not open the battery compartment in a flammable environment.
- Always make sure that the strobes and accessories are securely mounted to prevent them from falling off, becoming lost, causing personal injury or equipment malfunction.
- Do not attempt to disassemble the strobe. Contact with internal high voltage circuitry can cause personal injury.
- Do not alter or modify the strobe. User modifications can result in flooding or malfunction. User modifications will void the product warranty.
- If you detect smoke or an acrid odor, discontinue use immediately. Remove the batteries from the strobe and send the strobe to an authorized Sea & Sea dealer.
- In the event of flooding, turn off the strobe and camera. Discontinue use immediately. Remove batteries from camera and strobe. Send to an

authorized Sea & Sea repair center for evaluation and repair.

*If flooded, beware of increased pressure inside the strobe. Handle with extreme care when opening.

- Do not short-circuit the connector pins. That may cause equipment malfunction.
- During transportation or when not in use for an extended time, remove batteries to avoid unwanted battery consumption due to accidental activation of the power switch.
- The YS-90AUTO strobe incorporates plastic parts. Do not subject this strobe to extreme heat, such as on a car dashboard, or to direct sunlight. Plastic parts are prone to warping.
- SEA & SEA Products Ltd. will not be responsible for costs incurred for film and/or processing should malfunction of the YS-90AUTO strobe, camera or accessories result in unsatisfactory photographs.

<Precautions for Storage of the Strobe>



CAUTION!

- When not in use for an extended period of time, remove batteries; possible battery leakage will cause equipment malfunction.
- Do not store in a damp or humid environment. It can cause mildew or malfunction.
- Do not store in a chemically-laden environment. Naphthalene, camphor, or other harmful chemicals can cause mildew, rust, corrosion, and other damage to the metal and rubber components in this product.
- When storing the strobe for a long period of time, periodically attach to the camera and trigger the shutter release (with batteries and without film). This will exercise the internal parts and keep the strobe in good working condition.

Handling the O-Ring



CAUTION!

A special silicone oil-impregnated blue O-ring is used in this product. For maintenance of this blue O-ring, use Sea & Sea silicone grease in a tube with BLUE cap and lettering. Never use Sea & Sea silicone grease in a tube with a BLACK cap or other manufacturers' brands. Incompatible silicone grease will cause the O-ring to lose its waterproofing ability. If you have applied incompatible grease on a blue O-ring, the O-ring must be replaced.

The O-ring on the battery cover of your YS-90AUTO provides an airtight waterproof seal. Improper handling and maintenance of the O-ring can cause flooding. Please observe the following precautions carefully.

- **Always inspect the O-ring for scratches, cracks or cuts.**

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 the O-Ring Remover, 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.

- **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.**

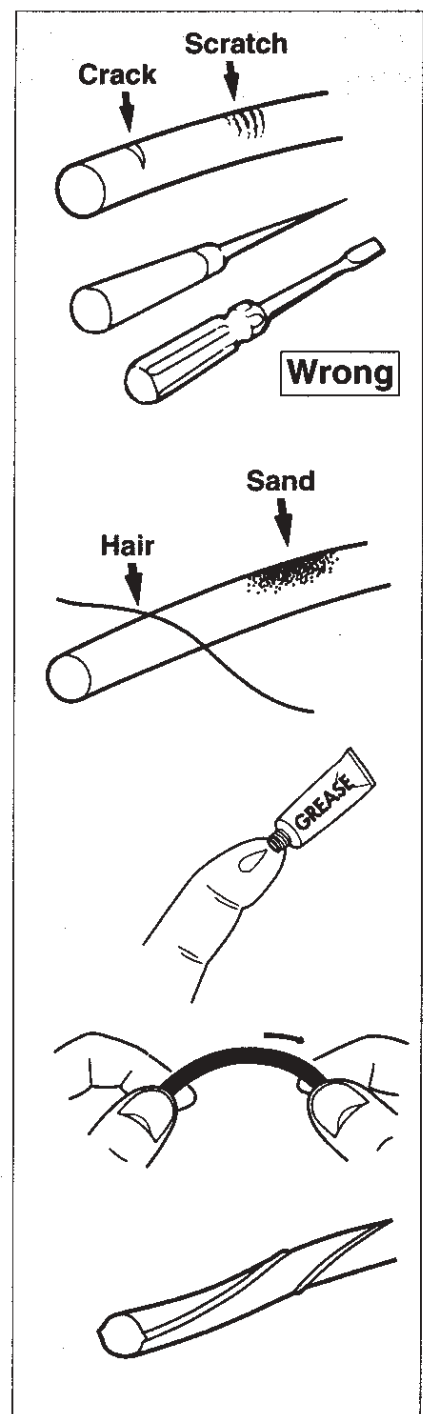
Always store your O-ring in an airtight container and in a cool environment. Keep out of direct sunlight. Take care that it is stored flat and not bent or twisted. Do not place any heavy objects on it; excessive weight will flatten it and impede its sealing capability.

- **The O-ring's life is one year.**

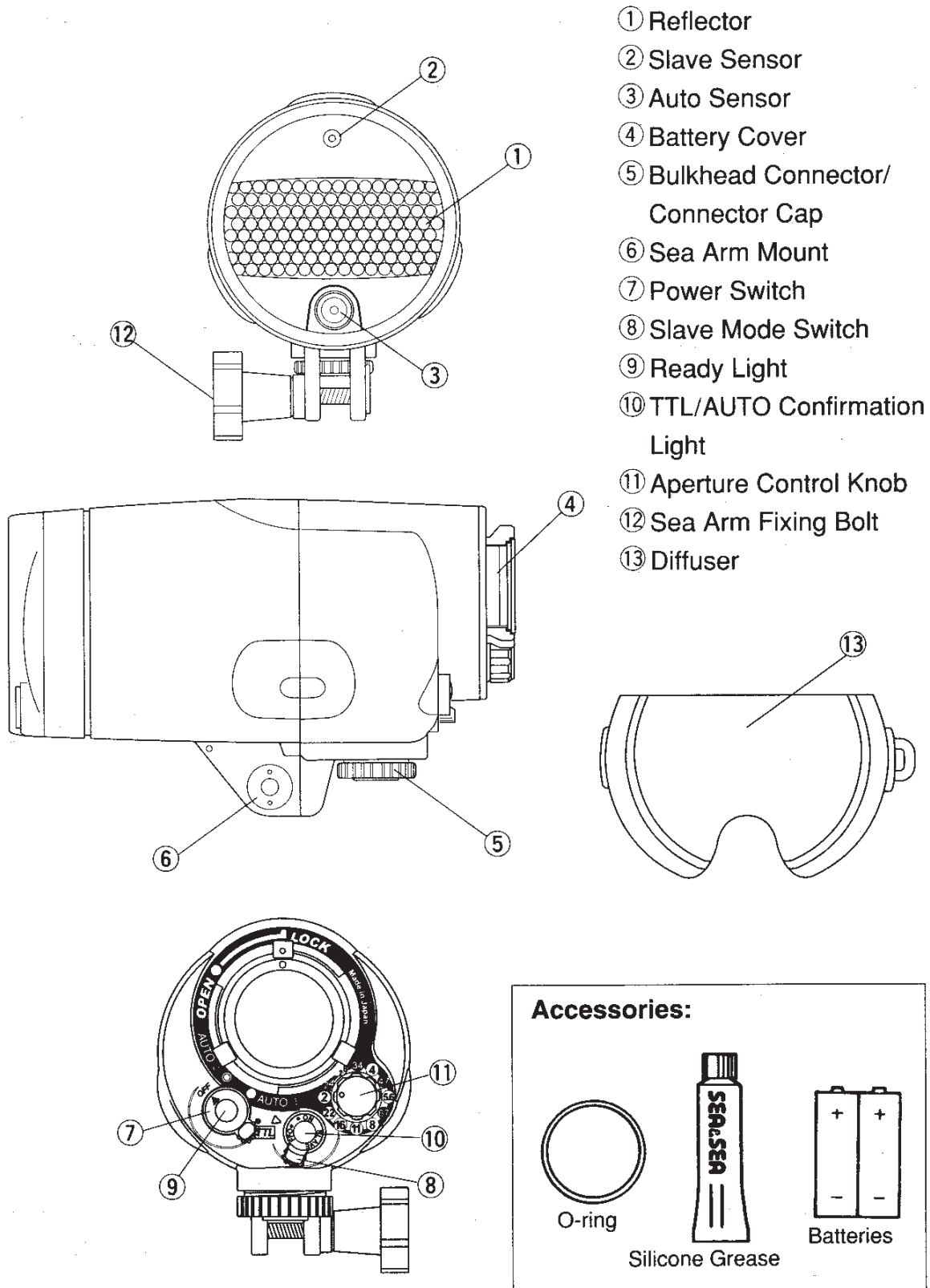
The life of the O-ring depends on the diligence of your maintenance, frequency of use, and storing conditions, but on average, if you maintain your O-ring properly, it will retain its watertight integrity for one year.

- **Remove the O-ring for inspection.**

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



Identification of Parts



Before Taking Photographs

How to Install the Batteries

The YS-90AUTO is powered by four AA alkaline, Ni-MH, lithium or nickel-cadmium batteries rated up to 1000mA.

Battery Installation and Removal

1. To remove the battery compartment cover, turn part ① counterclockwise to the OPEN position and pull the cover ② straight out. (Figure 1)
2. Make sure that the power switch is in the OFF position. Insert four batteries with the polarity shown in the battery compartment. (Figure 2)
3. Examine the O-ring for cuts or debris. Lubricate the O-ring lightly.
4. Fit the battery cover in place, aligning the “○” marks on parts ① and ② with the “○” mark at the OPEN position. Turn part ① to the LOCK position; you will hear it click into place. (Figure 3)

⚠ CAUTION!

- * Never replace batteries with wet hands.
- * Use extreme care not to allow water from your hair or wetsuit to drip into the battery compartment.
- * Always replace all four batteries with fresh batteries of the same kind and same expiration date. Never mix manufacturer's brands.

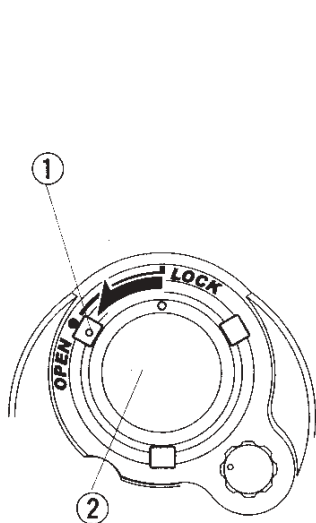


Figure 1

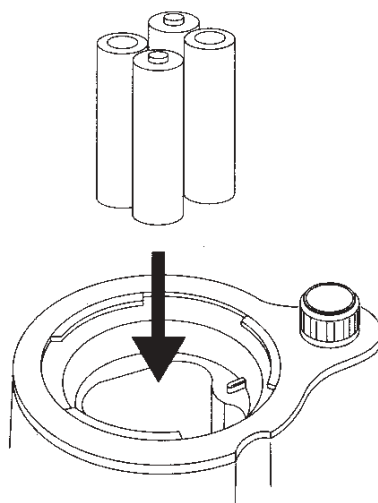


Figure 2

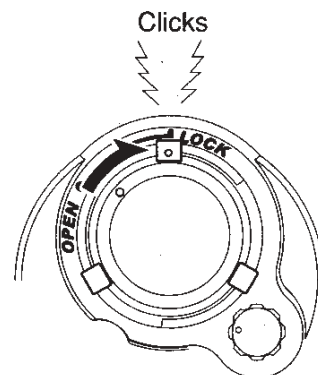


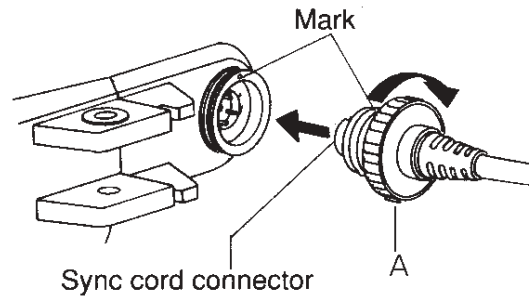
Figure 3

How to Connect the Sync Cord with the Strobe

The sync cords are detachable. One connector end mates with the strobe and the other with your camera or housing.

Note:

* When attaching or detaching the sync cord, grasp the connector end, not the cord. Never pull, twist or bend the cord as that may damage the electrical wiring.



1. Examine the sync cord connector O-ring for cuts or debris. Lubricate the O-ring lightly.

2. Align the mark on the cord with the mark on the strobe. Insert the five-pin connector into the strobe's bulkhead connector and push in until the O-ring is seated. Rotate the threaded retaining ring (part A) clockwise until it is secure.

To disconnect, turn (part A) counterclockwise, then pull the connector straight out.

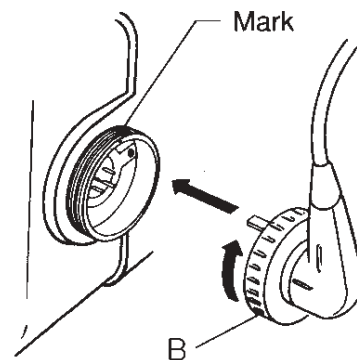
How to Connect the Sync Cord with the Camera

Four-pin sync cord (S) for Motor Marine II

1. Examine the connector O-ring for cuts or debris. Lubricate the O-ring lightly.

2. Align the indexing pin on the cord with the notch in the camera's bulkhead connector, as shown. Insert the four-pin connector into the camera's bulkhead connector and push in until the O-ring is seated.

3. Turn the threaded retaining ring (part B) clockwise till tight.



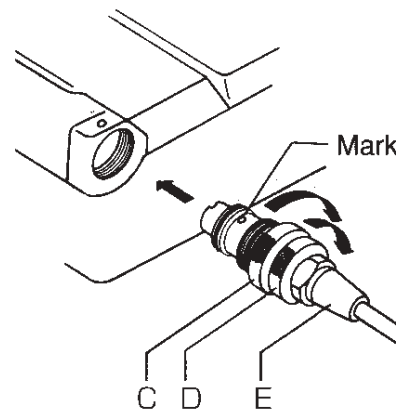
To disconnect, turn the threaded retaining ring (part B) counterclockwise till loose and pull straight out.

Five-pin sync cord (N) for Nikonos

1. Examine the connector O-ring for cuts or debris. Lubricate the O-ring lightly.

2. Turn the large locking ring (C) counterclockwise until snug against the small ring (D).

3. Align the notch in the cord with the index mark on the camera's bulkhead connector, as shown. Insert the five-pin connector into the camera's bulkhead connector. Push the cord in until the O-ring is seated.



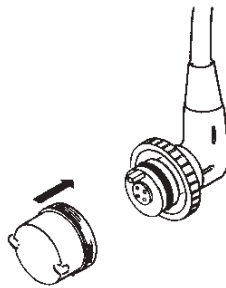
4. Rotate part (D) clockwise till secure.

5. When connecting to a Nikonos III, turn part (C) till it securely holds the camera to the stay.

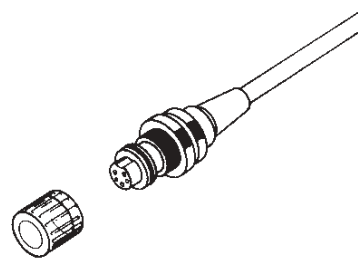
To disconnect, loosen and release the connector end by reversing steps 1-4 above. Pull out the connector straight out. When pulling out the connector, do it by holding part (E). Do not pull, twist or bend the cord.

Note:

- * Do not touch the connector's contact pins with fingers. Be careful not to get silicone grease on the contact pins. It will impede its function. If grease does accidentally contaminate the pins, clean with alcohol.
- * Whenever the sync cord is not connected to the camera and strobe, protect the ends of the cords and bulkhead connector with their plastic protective caps. Note: The cap for the end of the connector that attaches to the strobe is different from the end of the connector that attaches to the camera.
- * Before rinsing a detached sync cord, be sure to put the connector caps on the exposed ends.



Sync Cord S



Sync Cord N

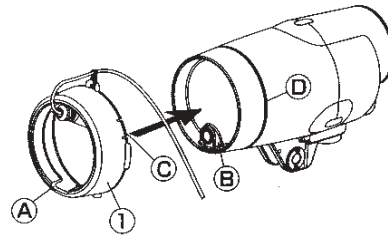
Fiber Optic Cable

The YS-90AUTO can be dedicated to various digital camera housings by means of the Sea & Sea fiber optic cable (sold separately).

- * Some housings are not compatible.

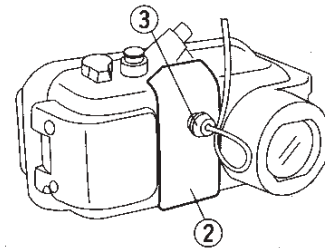
How to Connect the Fiber Optic Cable with the Strobe

Align the recessed part (A) of the fiber ring (C) with the Auto sensor (B). Push the ring onto the strobe until it clicks into the groove (D).



How to Connect the Fiber Optic Cable to a Digital Camera Housing

- ① Attach the strobe mask (2) on the housing in front of the camera's built-in flash.
 - ② Connect the fiber optic cable (3) to the strobe mask.
(See the instruction manual packaged with the Fiber Optic Cable for detailed instructions.)
- * Remember to set the built-in strobe of the digital camera to the flash mode. The YS-90AUTO will not flash if the strobe of the camera does not flash.



Controls

YS-90AUTO has two switches: The power switch and slave switch. See below for the appropriate switch position depending on the sync connection with your camera.

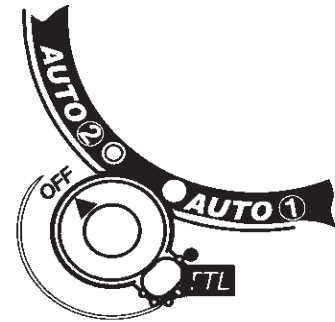
<Power Switch>

[OFF]

Turn the power switch to this position to turn off the power. Keep the switch at this position while this strobe is not in use.

[AUTO ②]

Turn the power switch to this position when you take auto strobe shots with a digital camera with pre-flashing function. In other words, turn the switch to this position if the built-in strobe of your digital camera flashes twice when shooting under forced flashing mode.



Note:

- * Remember to set the built-in strobe of your digital camera to forced flashing mode before use.
- * Slave switch must be set to "ON" at this time. (YS-90AUTO will not flash when the slave switch is set to the "OFF" position.)

[AUTO ①]

Turn the power switch to this position when you use a sync cord for auto strobe shots or when you use a digital camera without pre-flashing function (its built-in strobe flashes only once).

Sync Cord

When connected to your camera with a sync cord, YS-90AUTO flashes when the shutter gets released.

Note:

- * Slave switch must be set to "OFF" when a sync cord is used.

Auto strobe shots using a digital camera without pre-flashing function.

Note:

- * Remember to set the built-in strobe of your digital camera to forced flashing mode before use.
- * Slave switch must be set to "ON" at this time. (YS-90AUTO does not flash when the slave switch is set to "OFF" position.)

[TTL]

Turn the power switch to this position for shots using the TTL automatic light level control function ("TTL shot (s)").

When the power switch is at this position, aperture control knob cannot be used. (Light level will be controlled automatically regardless of the position of the light level control switch.)

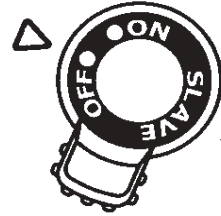
Note:

- * TTL shots require a sync cord connection and a housing and camera with TTL function. Therefore, TTL shots are not available with housings without sync cord connectability or TTL capability. This setting uses the cameras TTL sensor to control the flash.
- * YS-90AUTO does not have cordless TTL function.

<Slave Mode Switch>

[ON]

This switch enables YS-90AUTO's slave function. YS-90AUTO will flash when its slave sensor detects an external light. Turn the slave switch to this position when you use an optic fiber cable.



[OFF]

Turn the slave switch to this position when you do not use the slave function or when you use a sync cord.

Note:

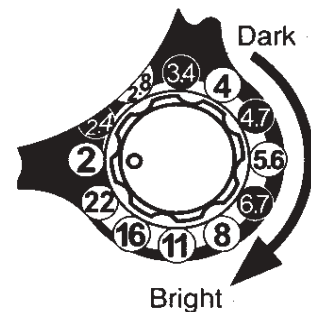
- * When you use an optic fiber cable, YS-90AUTO does not flash if the slave switch is in the OFF position even if the power is ON.
- * YS-90AUTO does not have cordless TTL function.

<Aperture Control Knob>

This knob can be used when the power switch is in [AUTO ①] or [AUTO ②].

By adjusting this aperture control knob to the value that is used for aperture control of your camera, YS-90AUTO automatically flashes at the optimum light level for the setting.

12 steps of aperture values are available. Numbers in white circles represent full steps. Numbers in black circles represent half steps. At a certain distance from the subject, turning the aperture control knob clockwise increases the light level (resulting in a bright picture) and turning it counter-clockwise decreases the light level (resulting in a dark picture).

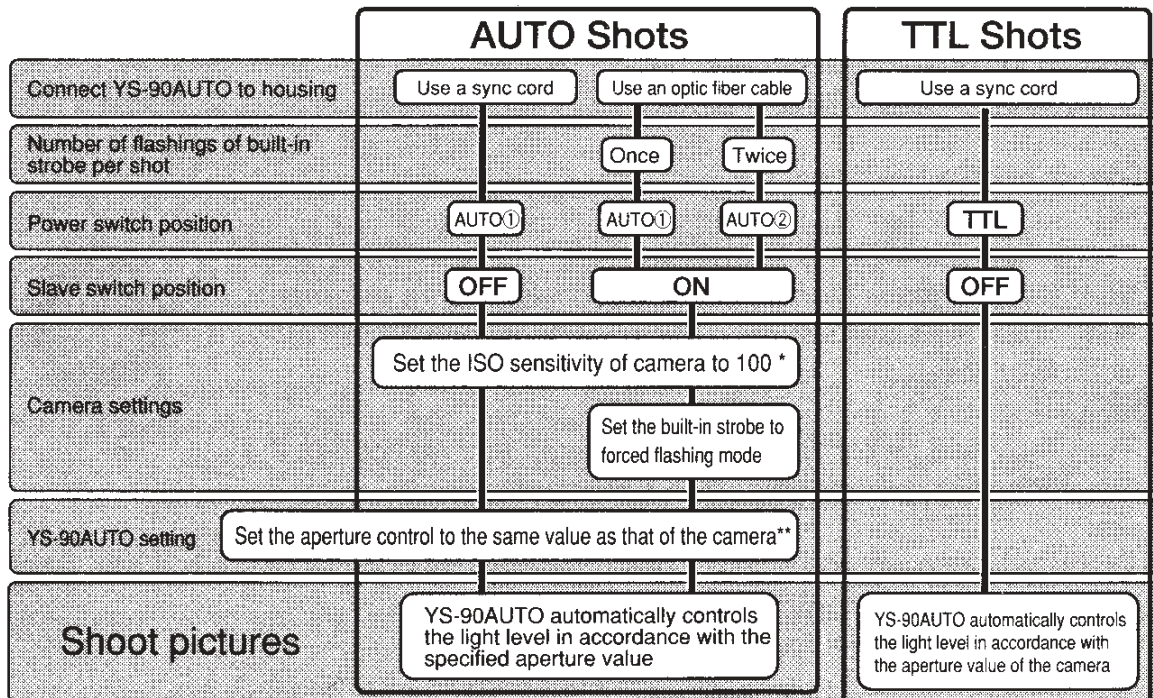


(The greater the number you choose, the brighter gets the strobe.)

Note:

- * You can set the knob to the position between the numbers when you do not find exactly the same "f" number as the one used for your camera.
- * When the power switch is at the TTL position, the aperture control knob cannot be used. (Light level will be controlled automatically regardless of the position of the light level control switch.)
- * The indicated aperture values are references based on use on land. Adjustment will be required considering the effect of water opacity and quality, floating objects, etc.

Switch Settings and Preparation for Shots



*

If your camera cannot be set to ISO 100 sensitivity

- Set the aperture value of YS-90AUTO to "open" side (smaller value). The aperture setting of YS-90 changes depending on the ISO number as shown in the table below.

1. step (-1EV) for ISO 200 (Example: 4 → 2.8)
2. steps (-2EV) for ISO 400 (Example: 4 → 2)

- Set the aperture control knob to the position between the numbers when you do not find exactly the same number as the one used for your camera.

**

If your camera does not have aperture control

- Check the aperture value that is indicated when shutter release is half-pressed and set the aperture control knob of YS-90AUTO to that value.
- Set the aperture value of YS-90AUTO to the open side aperture value (smaller number) of the camera. (See the instruction manual or catalog of your camera.)

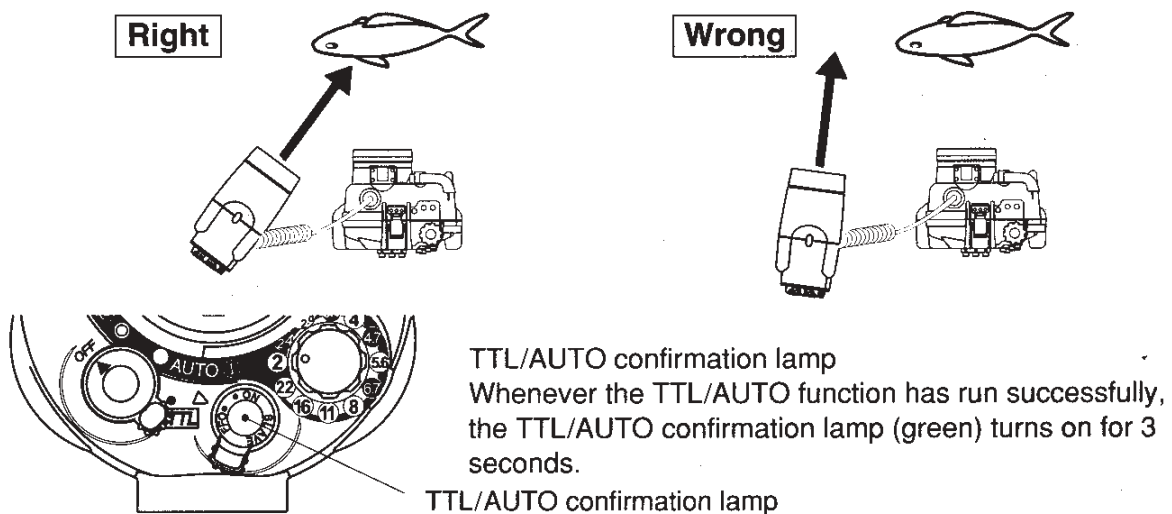
TTL shots require sync cord connection to a housing that has TTL capability

Aperture value of camera	Aperture Setting of YS-90AUTO corresponding to ISO sensitivity of camera		
	ISO 100	ISO 200	ISO 400
2	(2)		
2.4	2.4		
2.8	(2.8) → (2)		
3.4	3.4 → 2.4		
4	4 → 2.8 → 2		
4.7	4.7 → 3.4 → 2.4		
5.6	(5.6) → 4 → (2.8)		
6.7	6.7 → 4.7 → 3.4		
8	(8) → 5.6 → 4		
11	(11) → 8 → 5.6		
16	(16) → 11 → 8		
22	(22) → 16 → 11		

Cameras with no aperture control automatically adjust the aperture depending on the shooting conditions. In the dark underwater environment, the aperture is automatically adjusted to the open side (smaller number). In the shallow and bright seawater or with backlight, it is set to the closed side (larger number). So user must adjust the aperture control knob accordingly. The aperture control of camera varies with the manufacturer, specifications and settings of the camera, so refer to the instruction manual and specifications of your camera for these details.

Taking pictures

With its auto sensor (located below the bulb) sensing the brightness around the subject, YS-90AUTO automatically controls its light level according to the specified aperture value. The flashing side of YS-90AUTO needs to face the subject. Otherwise, it may cause malfunction due to failure of auto-sensing.

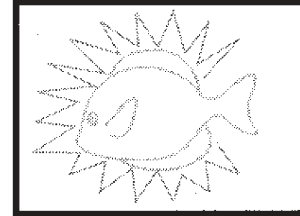


If you experience overexposure (whiteouts)

Depending on the shooting conditions such as short distance, the resulting picture may have whiteouts due to overexposure.

To prevent this, try the following countermeasures:

- Set the aperture control knob of YS-90AUTO to open side (smaller value).
- Set the aperture value of the camera to closed side (larger value).
- Set the exposure correction control of the camera to "+ (positive)" side.
- Set the ISO sensitivity of the camera to a value lower than 100.
- Attach a light reduction filter / diffuser to YS-90AUTO.
- Using a long arm, move back the YS-90AUTO to provide a longer distance from the subject.



Adjust the light level using an appropriate countermeasure or combination of them depending on the camera specification and shooting conditions.

If you experience underexposure (dark picture)

Depending on the shooting conditions such as a short distance, the resulting picture may look too dark due to underexposure.

To prevent this, try the following countermeasures:

- Set the aperture control knob of YS-90AUTO to closed side (larger value).
- Set the aperture value of the camera to open side (smaller value).
- Set the exposure correction control of the camera to "- (negative)" side.
- Set the ISO sensitivity of the camera to a value higher than 100.



Adjust the light level using an appropriate countermeasure or combination of them depending on the camera specification and shooting conditions.

TTL Operating Range (reference only)

Aperture	ISO					DISTANCE	
	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
11	8	5.6	4	2.8	0.3~1.9	1~6.3	
16	11	8	5.6	4	0.3~1.3	1~4.3	
22	16	11	8	5.6	0.3~1	1~3.3	
	22	16	11	8	0.3~0.6	1~2	
		22	16	11	0.3~0.5	1~1.6	

UNDERWATER EXPOSURE TABLE

* You may have to further adjust aperture from the above reference table depending on subject reflectivity, underwater conditions, visibility, etc.

Diffuser

How to Use the Diffuser

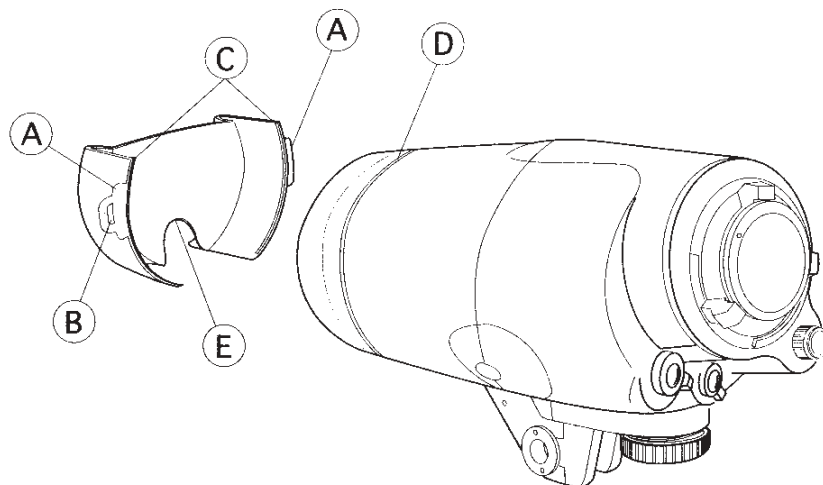
- This diffuser reduces the guide number of the YS-90AUTO to 16 on land (ISO 100/m) and 8 underwater (ISO 100/m). Open up by one f-stop when using this diffuser.
- Always rinse the diffuser with fresh water after use.
- Always dry the the diffuser with a soft cloth after rinsing.
- Do not subject this diffuser to extreme heat, such as on a car dashboard, or to direct sunlight.

Attaching and Removing the Diffuser

1. Hold part (A) with your fingertips and press onto the front of the strobe. Two rims (part C) must fit snugly into the the groove (D) on the strobe.

⚠ CAUTION!

- * Always make sure that the two rims are fitted securely into the groove. The diffuser may come off and be lost or damaged unless it is securely attached.
2. To detach the diffuser, hold part (A) with your fingertips and pull the rim (C) off the groove (D) at one side and then at the other side.
- * To prevent loss of the diffuser, should it come loose from the strobe, thread a tie through the hole (B) and attach to the Sea Arm or Sea Arm bolt.



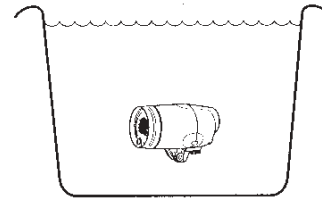
Maintenance and Storage

1. After use, rinse well with fresh water. Be sure that all protective caps and covers are securely in place.
2. After rinsing, dry with a clean, soft cloth

Note:

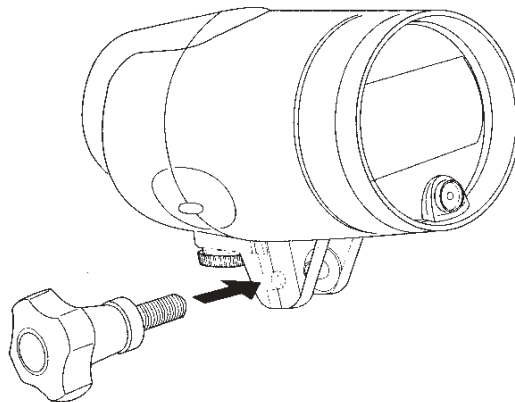
* Do not use heater or hair dryer to dry the strobe.

3. Remove batteries after use. Be sure the battery compartment cover is completely dry before opening; be careful not to let water drip into the battery compartment. If water penetrates the battery compartment, dry immediately.
4. After use, lubricate the connector O-ring and cover the connector ends with their plastic caps.
5. When storing the strobe for a long period, take care not to expose the strobe to high temperature, high humidity, direct sunlight or extremely low temperature.



Attaching the Arm Fixing Bolt

Insert the fixing bolt through the non-threaded side of the Sea Arm mount. With the arm correctly positioned, push the fixing bolt through the arm, then screw in to the threaded side of the Sea Arm mount till secure.



Specifications

Controls and Functions:	Power switch: OFF, \odot AUTO②, \circ AUTO①, TTL Slave mode switch: ON, OFF Aperture Control Knob:12 steps
Indicators:	Ready lamp (Red LED light up when charging is complete) AUTO/TTL confirmation lamp (Green LED lights up for approximately 3 seconds to confirm a correct automatic expose)
Guide Number:	22 (land,ISO 100/meters)
Apature Control:	12 steps (2/2.4/2.8/3.4/4/4.7/5.6/6.7/8/11/16/22)
Beam Angle:	105° x 95° (full Power)/with Diffuser 105° x 105° (full Power)
Color temperature:	5600° (full Power)/with Diffuser F5100°K (full Power)
Battery life(full Power):	4 AA alkarine batteries: Approximately 200 flashes 4 AA Ni-MH batteries (1700 mA):Approximately 260 flashes 4 AA Ni-Cd batteries:Approximately 120 flashes 4 AA Lithium batteries:Approximately 300 flashes
Recycle time(full Power):	4 AA alkarine batteries: Approximately 6.5 seconds 4 AA Ni-MH batteries (1700 mA): Approximately 3 seconds 4 AA Ni-Cd batteries: Approximately 4 seconds 4 AA Lithium batteries: Approximately 4 seconds
Bttery Requirements:	4 AA alkarine batteries: (1.5V x 4 = 6V) , or 4 AA Ni-MH batteries (1700 mA): (1.5V x 4 = 6V) , or 4 AA Ni-Cd batteries: (1.2V x 4 = 4.8V) , or 4 AA Lithium batteries: (1.5V x 4 = 6V)
Depth Rating:	60m (200 feet)
Dimentions:	115 (H) x 88 (W) x 160mm (D)/740g (4.5 x 3.5 x 6.3 inches)
Weight:	740g (land) , -80g (underwater) *including batteries
Accesories:	4AA alkaline batteries,Sea Arm fixing bolt, silicone grees,O-ring, diffuser

※Specifications and prices are subject to change without notice.