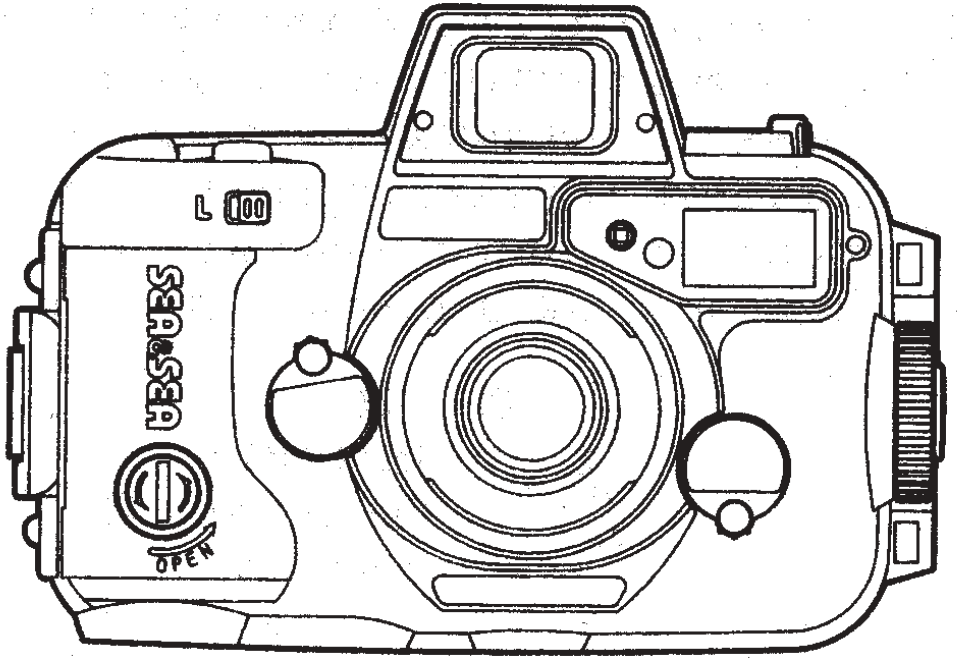
MOTOR MARINE II EX

取扱説明書
INSTRUCTIONS



SEA&SEA

MOTOR MARINE IIEX

Thank you for purchasing the Motor Marine IIEX, Sea&Sea's most sophisticated,fully automated amphibious camera. Designed with the most advanced technology, the MM-IIEX features TTL and manual operation, a built-in 35mm lens that can be used both underwater and on land, and a revolutionary built-in close-up lens. It has been designed with a bayonet mount fitting to accommodate auxi- liary macro and wide angle lenses that can be attached and removed underwater, providing the photographer with unlimited versatility.
The MM-IIEX is a state-of-the-art system for serious underwater photographers.

To achieve consistent, successful photography with this model, please read this instruction booklet carefully. Keep it together with your warranty card for future reference.

If you have any questions as to how to use this system, or want information regarding auxiliary equipment to expand your system, please contact your local Sea&Sea dealer.

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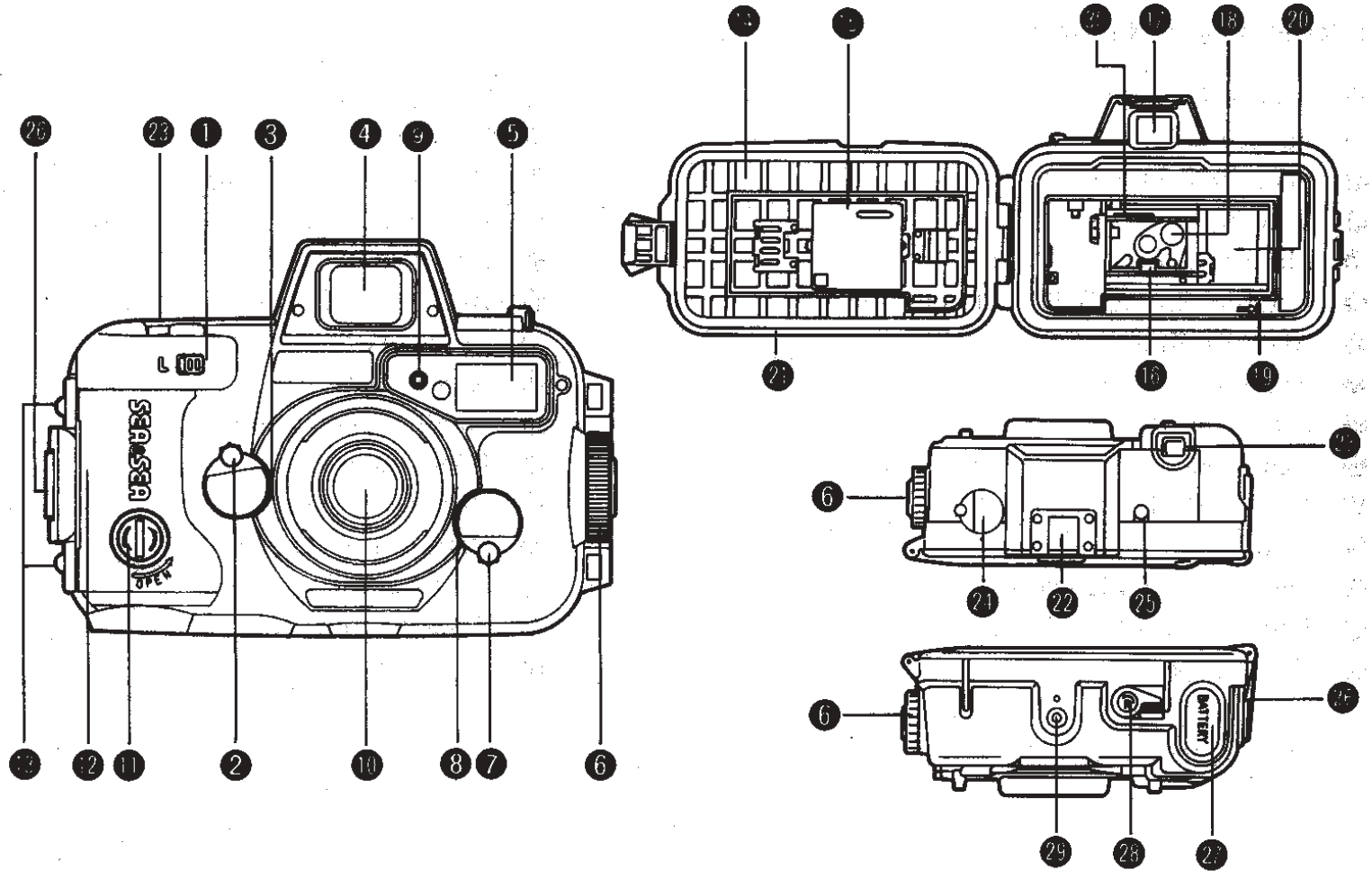
SPECIFICATIONS

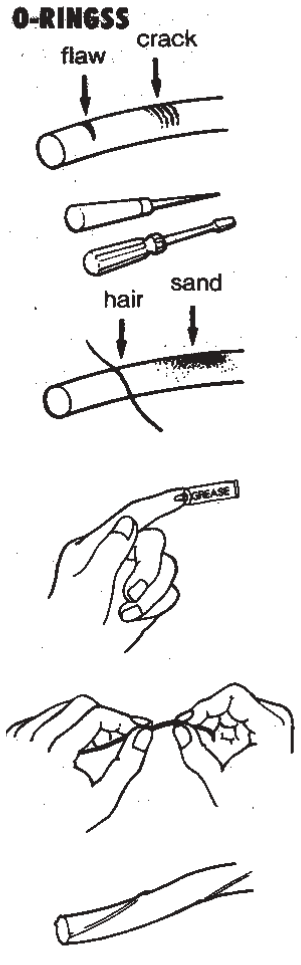
Type:	35mm amphibios camera
Picture format:	36 × 24mm JIS 135 film
Lens:	F3.5 f=35mm 3 groups 34 elements
Foucus control:	Eye-measured ciontrol by means of focus knob m ∞~1∞,5,3,2,1.5,1.2,1 ft ∞~3∞,10 5 3 0.5m close-up photography is possible with the focus knob set at the "CU" position
Film speed:	Automatic (with DX coded film) at ISO 50, 100 or 400
Exposure control:	Low exposure warning (Red LED light will appear when the shutter button is half-pressed.) CDS sensing LED display
Viewfinder:	Alberta-type is single-lens direct optical viewfilder 0.5 magnification; 85%or more frame coverage; dipoter:-1.0 dipotry
Viewfinder information:	Displays within visual field.....with bright frame With correction marks for short-distance and close-up Red lamp: Low exposure warning (Lights up when the shutter button is half- pressed.) Green lamp: TTL automatic light adjustment lamp (when using the external TTL strobe) when correct TTL exposure is confirned. Orange lamp: Lights up when the strobe is ready. Green lamp: Goes on and off to indicate film advance. Green lamp: Battery checker (Lights up with the release half-pressed.) Lights up as an O.K. indication for voltage 2.6V and over. Goes off when voltages is 2.59V or under.
Shutter:	Fixed magnetic shutter

	1/125, 1/60, 1/30, 1/15 sec. Can be synchronized with the external strobe at all shutter speeds.
Synchronization contact:	X contact External connector (MM-II 4P connector)
Built-in strobe:	GN 10; ISO 100/m Can be used at all shutter stops when set at the ⚡ position. (Shutter speed fixed at 1/125.)
Power source:	2 SUM-3 (AA) type dry batteries 3V (Nickel-cadmium and lithium batteries not usable.)
Max. number of film rolls photographable:	
	About 20 rolls of 36-frame film rolls (when the built-in strobe is used for 10 rolls)
Film advance:	Automatic
Film rewind:	Automatic by means of the film rewind lever. Stops automatically when rewinding is completed.
Maximum depth:	45 meters (150 feet)
Dimensions, weight:	70 × 112 × 160mm; 640g (including batteries)
Standard accessories:	Shoulder strap, silicone grease, exposure calculation table sticker, O-rings (for back cover and battery case)
Accessories:	Accessories can be purchased. All accessories for MM-II are compatible.


L 100
OPEN
BATTERY

DESCRIPTION OF COMPONENTS

1. Shutter Button Lock
2. Focus Knob
3. Focus Indicator
4. Viewfinder
5. Flash Window
6. External Strobe Bulkhead Connector
7. Aperture Knob
8. Aperture Indicator
9. CDS Light Receptor
10. 35mm lens
11. Battery Pack Lock
12. Grip
13. Shoulder Strap Holders
14. Back Cover
15. Film Support
16. TTL Sensor
17. Viewfinder Eyepiece
18. Built-in Close-up Lens
19. Film Tip Mark
20. Film Drum
21. Back Cover O-ring
22. Accessory Shoe
23. Shutter Button
24. Shutter Speed Knob
25. Film Counter
26. Back Cover Lock
27. Battery Pack Cover
28. Film Rewinding Lever
29. Tripod Screw
30. Sprocket



The MOTOR MARINE IIEX maintains its waterproofness by use of O-rings. In order to make the most of the O-rings, take the following precautions. Improper handling may cause water to get into the unit.

①Is there a cut or crack in the O-ring?

Make sure there is no cut or crack in the O-ring. If there is, immediately replace the O-ring with a new one.

When handling the O-ring, avoid using a sharp-pointed metal item, knife or screwdriver, which could make a cut in the O-ring.

②Take precautions against dust, sand and hair!

Make sure that no dust, sand or hair is adhering to the O-ring, its groove or its contacting surface. If any is found, remove it completely. Continued use with such matter intact could cause water to get in.

③Silicone grease

Silicone grease prevents the O-ring from wearing. After confirming that no cut, dust or dirt remains on the O-ring, use your fingertip to apply a thin coat of grease. Do not apply too much grease. Otherwise, it may gather dust and dirt, causing water to get in.

④Do not twist the O-ring!

When mounting the O-ring on the groove, do not twist it or allow it to go on crooked.

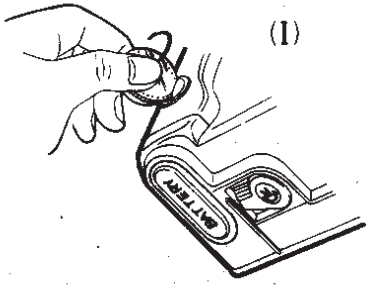
⑤Storing the O-ring

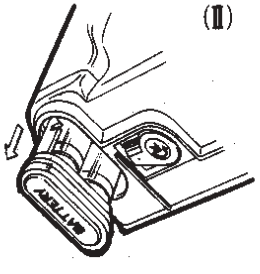
For storage, keep spare O-rings or the detached O-ring in a cool place away from direct sunlight. Do not put a heavy object on the O-ring or bend it.

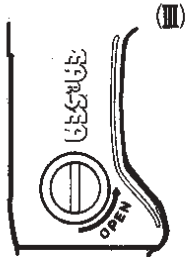
⑥Life of O-rings

O-rings usually last for 1 to 2 years, depending on maintenance conditions, frequency of use and storage conditions. Make inspection prior to use. Early replacement is recommended.

HOW TO INSTALL THE BATTERIES







I) Remove the battery pack in the left side of the main unit's front, and use a coin to turn the lever (11) counterclockwise 90 degrees. (In doing so,remember to hold the camera upright with the battery chamber facing downward.)

II) Pull out the battery pack cover (27) as it slides out of the camera's bottom.

III) Insert two fresh batteries according to the polarity marks inside the battery pack. (Before inserting them, inspect to make sure if there is no dust or sand adhering to the battery pack O-ring and the O-ring is not out of place, twisted or cut.)

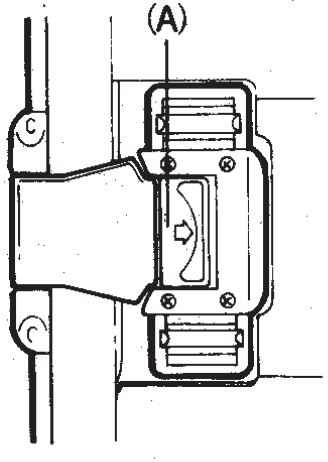
IV) Lastly, insert the battery pack fully into the battery chamber until you hear a clicking sound and the coin groove on the battery-pack removing dial comes to the vertical position.

Caution!

- Two alkali-manganese dry batteries are used for this unit. Always use new batteries of the same type. Though manganese batteries can also be used, they will last for only an extremely limited number of film rolls because of their limited charging capacity.
- Detach or install batteries quickly.
- Do not use Ni-Cd or lithium batteries.
- Replace both batteries for ner ones immediately when you notice the green lamp going off with the shutter button half- pressed. Continued use without replacing the batteries may not allow the shutter to release during use.

HOW TO OPEN THE BACK COVER

To remove the back cover opening lever (26), slide the lever's lock (A) in the arrow direction. Open the back cover by raising the lever with your finger.



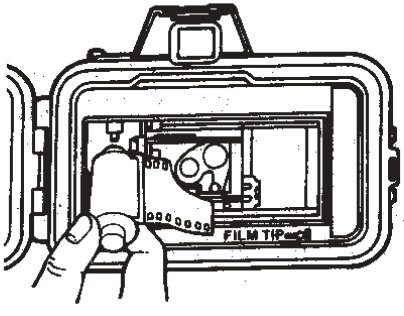
Note

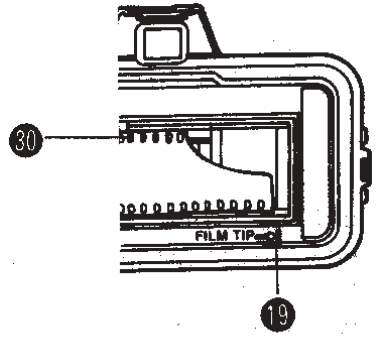
- ●In order to protect the mechanism inside the camera from 45- meter-deep water pressure, the main body and back cover of the MOTOR MARINE IIEX are designed to be extremely rugged in a way defferent from ordinary cameras.
- ●Before opening the back cover, be sure the camera is completely dry and clern. If necessary, rinse it with fresh water and dry thoroughly with a soft, dry cloth.
- ●Especially when opening the back cover immediately after using it underwater, be sure to hold the camera with the back cover facing downward and take care not to allow residual water drops or sand to get in.
- ●Locking the back cover with sand or water drops adhering to it may damage the interior mechanism or cloud the viewfinder.
  Back-cover opening/closing should be done in a place safe from foreign matter.

FILMS

- ●Use films with the DX mark. (Most films available have that mark.)
- ●The proper film speed will be set automatically when you load the MOTER MARINE IIEX with DX-mark film.
- ●Film speed will be automatically set to ISO 50 for any film without the DX mark.

HOW TO LOAD THE FILM





I) Insert the flat end of the filmcartridge into the film chamber as shown in the illustration, then lower the other end. If it is hard to get the cartridge in, jiggle it lightly left and right, then push it securely into the guide pin. The film should be pressing against the upper end of the cartridge chamber.

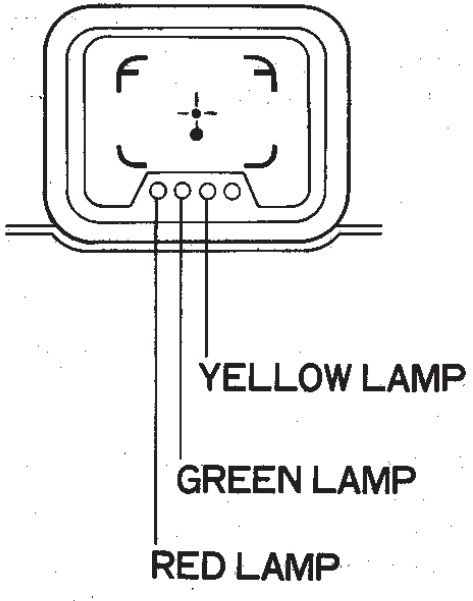
II) Pull out the leader of the film from the cartridge. Align the tip of the leader with the mark (19).

III) Place the film properly on the film guide, then confirm that the perforations of the film are securely fitted over the take-up sprocket (30) and that there is no slack. Also make sure no sand, dust or water drops are adhering to the back-cover O-ring or that part of the camera's main body which comes in contact with the O-ring.

IV) Close the back cover after confirming that the O-ring is not twisted or out of place. Press the back-cover opening lever against the camera's main bady, and it will snap-shut with an audible click.

V) Unlock the shutter button lock (1) by sliding it in the direction opposite to "L".

VI) Depress the shutter button (23) a few times until the number "1" appears in the film counter (25). Also confirm that the film-advance check lamp (green) within the viewfinder is going in and off. If it is not, the film is not set properly.
In that event, repert the film loading process from the beginning as on page 10 (1).
Now you are ready to take pictures.



1)Setiing the Shutter Speed

●Set the shutter speed by turning the shutter speed knob so that the value will align with the indicator at a clicking position. You cannot set the shutter speed halfway between the given values. When set at the ⚡ position, the built-in strobe will be switched on. In that event, the shutter speed is fixed at 1/125 sec.

(2)Setting the Aperture

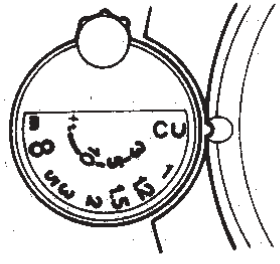
●Turn the aperture knob to align the stop value with the indicator. There is a click at figure positions, but aperture setting can also be made halfway between figures.

(3)Setting the Exposure

●The MM-IIEX has six aperture settings, from F3.5 to F22, and four shutter speeds: 1/125, 1/60, 1/30 and 1/15. If the low exposure warning lamp (red) glows, you must adjust for a correct exposure by combining aperture and shutter speed settings.

●For daytime photography, set the aperture knob at F16 and the shutter speed at 1/125 and depress the shutter button halfway while looking through the viewfinder eyepiece. (Be careful not to release the shutter.) Exposure is correct unless the red lamp within the viewfinder glows. If the red lamp glows, indicating low exposure, either set the aperture at F11 or the shutter speed at 1/60. Then face the camera toward the subject again and depress the shutter button lightly. Unless the red lamp within the viewfinder glows, you can start photography. (Otherwise, continue to adjust the aperture at F8, F5.6, etc. or the shutter speed at 1/30, 1/15,etc. until the lamp stops glowing.

●If the red lamp glows with the aperture at F3.5 and shutter speed at 1/15, switch to the built-in strobe photography mode. (Charging of the



strobe can be confirmed by the orange strobe ready lamp within the viewfinder.)

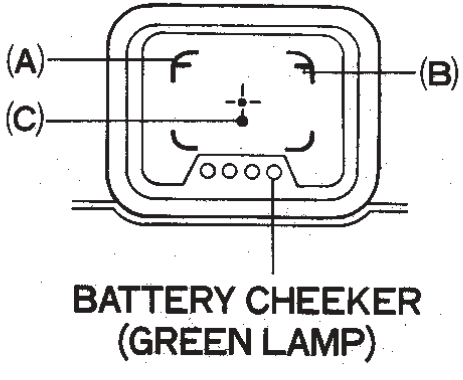
(4)Focusing

- Adjust the focus knob according to the eye-measured camera-to-subject distance.
- The MOTOR MARINE IIEX is equipped with a built-in close-up lens, which can focus sharply on subjects at distances from 50cm to infinity (∞). The built-in close-up Lens is auto-matically activated inside the camera's main body by setting the focus knob at the "CU" position.
- If the subject is at a distance of 5 meters or more, set the focus at infinity.

Note

- The camera will not function if the focus indicator is set between "1 meter/3 feet" and "CU."

(5)Viewfinder



- There are two sets of framing marks visible in the viewfinder. The one with four corners (A) will be the field of view for proper framing of subjects at a distance of 1 meter (3 feet) to infinity. The other with two parallax correction lines(B) underneath the upper two corners, shows the proper framing of subjects at a distance of 1 meter (3 feet).
- For close-up photography using the built-in close-up lens, the center of your subject should be positioned to meet the dot below the "+"mark (C) at the center of the frame. The distance then is 50 centimeters (20)inches).
- Depress the shutter button gently and firmly. Otherwise, blur will result. Once the shutter is released and the shutter button returns to the original position, the film will automatically advance by one

frame.

- If the battery checker lamp (green) does not glow with the shutter button depressed halfway, the shutter button will depress but the shutter inself will not function and the film will not advance.

TOPSIDE STROBE PHOTOGRAPHY

●The built-in electronic flash can be used indoors or outdoors when ambient light is insufficient for a proper exposure.

●Set the shutter speed knob (24) at the ⚡ mark. The built-in strobe will be switched on and charging will start. The shutter speed will be fixed at 1/125. When using the built-in close-up lens (camera-to-subject distance of 50cm), strobe photography at F16 (when ISO 100) is advisable. To photograph ordinary snapshots or souvenir pictures, F3.5 (when ISO 100) is recommended.

●The strobe ready lamp will appear within the viewfinder as charging is completed, indicating the flash is ready to fire.

●For best results using strobe photography, memorize the effective range of illumination, The aperture for strobe photography varies according to the film speed and the camera-to-subject distance. Refer to the "Exposure Calculation Table"(A). Be sure to set the shutter speed knob (24) away from the ⚡ mark when you do not photograph with the built-in strobe.

Film Sensitivity(ISO)			Focal Distance	
50	100	400	On Land	Under Water
	3.5	8	4.6~9.5ft	2.3~5ft
3.5	8	16	2 ~4.3ft	1 ~2ft
8	16		1 ~ 2 ft	0.5~1ft

Caution

●To conserve batteries, do not leave the camera with the shutter speed knob set at the ⚡ mark.
When set at the ⚡ mark, the shutter speed will be fixed at 1/125.

EXPOSURE CALCULATION TABLE

(METER)

m \ F	3.5	5.6	8	11	16	22
5	2.97～∞	2.39～∞	1.95～∞	1.59～∞	1.21～∞	0.95～∞
3	2.13～5.06	1.82～8.61	1.55～∞	1.32～∞	1.05～∞	0.84～∞
2	1.57～2.74	1.40～3.52	1.24～5.23	1.08～∞	0.89～∞	0.74～∞
1.5	1.25～1.88	1.13～2.21	1.03～2.78	0.92～4.08	0.78～∞	0.66～∞
1.2	1.03～1.43	0.96～1.61	0.88～1.89	0.80～2.42	0.69～4.47	0.60～∞
1	0.88～1.15	0.83～1.27	0.77～1.44	0.71～1.71	0.62～2.54	0.55～5.98
CU0.5	0.46～0.54	0.43～0.57	0.43～0.61	0.40～0.66	0.37～0.77	0.34～0.97

(FEET)

FEET \ F	3.5	5.6	8	11	16	22
10	7.07～17.1	6.02～29.6	5.14～∞	4.39～∞	3.46～∞	2.78～∞
5	4.15～6.29	3.77～7.43	3.41～9.39	3.04～14.0	2.58～∞	2.19～∞
3	2.68～3.41	2.51～3.72	2.35～4.14	2.18～4.84	1.93～6.70	1.71～12.4
CU1.6	1.50～1.78	1.41～1.87	1.39～1.99	1.32～2.17	1.21～2.53	1.10～3.18

UNDERWATER PHOTOGRAPHY

(1)Setting the Exposure

- There is considerably less light underwater than on land. As a yardstick, open up the aperture stop by stop for each 3 meters of depth from the exposure for topside photography. Just as in topside photography, adjust the exposure by combining the aperture and shutter speed settings in accordance with the low exposure warning lamp (red).

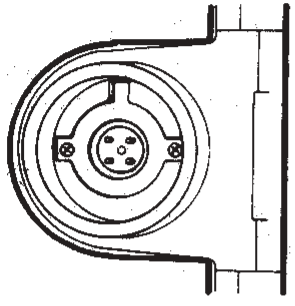
(2)Focusing

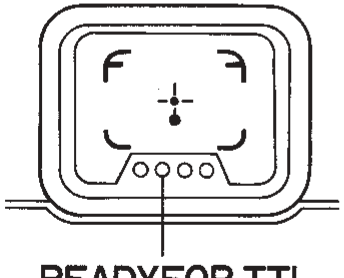
- Objects seen underwater appear closer than they actually are. This is called apparent distance. Lenses see the same apparent distance as human eyes see. Therefore, the focus knob mest be adjusted according to the apparent distance.
- The MM-IIEX can focus down to 50 centimeters (20 inches) by means of the built-in close-up lens.

Note

- No photography is possible when the focus is set between the "CU" mark and "1 meter/3 feet."

UNDERWATER STROBE PHOTOGRAPHY





(1)Photography with Built-in Strobe

- While the built-in strobe is basically used for topside photography, it is also used when the low exposure warning lamp (red) appears with underwater exposure set to F3.5 and 1/15.
- The aperture for photography with the built-in strobe varies according to the film speed and the camera-to-subhect distance. Refer to the camera-to-subject distances for underwater photography contained in Table (A) "EXPOSURE CALCULATION TABLE" (reference values) on page 16. We recommend underwater use of the built-in strobe for close-up photography using the built-in close-up lens.
- For convenience, paste up the accesory Exposure Calculation Table sticker to the camera's back cover.

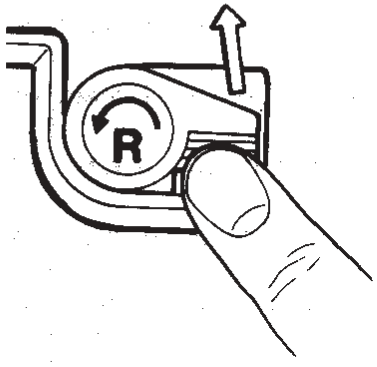
(2)Photography with External Strobe

- The external strobe connector is housed in the black, round capon the left-side panel of the camera's main body. The connector is a very delicate part. When opening thd cap, be sure to face the cap downward. Take good care not to allow water drops or sand to get in, or allow grease, sand or dust to adhere to the metallic synchronizing contact. Never touch the contact directly with your hand.
- With the MOTOR MARINE IIEX, you can have TTL light-adjustment photography by using a Yellow Sub Series external strobe with TTL specifications. In the TTL mode, the camera antomatically reads the reflected light off the subject and controls the strobe output to yield a proper exposure. When the TTL automatic light adjustment lamp (green) glows within the viewfinder, you know you are operating within the range of TTL light adjustment.
- In underwater photography,exposure may become insufficient under

certain light conditions, such as when facing the camera up toward the water's surface and when photographing small fish with a standard lens. In such cases, we recommend that you to photograph in the manual mode, not in the TTL mode.

- All Sea & Sea Yellow Sub Strobes are compatible with the MM-II by means of an exclusive adapter (which can be purchased separately). These provide ideal lighting for inderwater photography. (Limited to units with the super cord specification.)
- For attaching the external strobe or connecting the cord, refer to the Yellow Sub Strobe operation manual. (When connecting a conventional-type Yellow Sub Strobe, use the NEW Super Connector (product No.0340).)

HOW TO TAKE OUT THE FILM



I) The film rewinding lever (28) is positioned at the bottom of the camera body. Pull the lever in the direction of the arrow to activate the automatic rewind system. Keep pulling until it stops with an audible click.

II) Before opening the back cover to remove the film, be sure the camera is clean and dry.

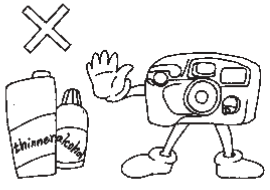
III) Always open the camera with the back cover facing downward.

* We recommend that you have your photographed films developed as soon as possible.

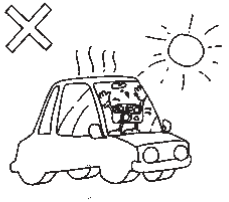
Note

- If the rewind lever should be accidentally pulled, even while taking pictures, the automatic rewind system will be activated and the film will be rewound.
- Keep depressing the rewind lever until the rewinding opetation automatically comes to a stop.

CARE AND MAINTENANCE



- ●Immediately after use inderwater, rinse the camera thoroughly in fresh water.
- ●Before pulling out the battery pack or opening/closing the back cover, be sure to wipe off any moisture on the camera, dry your hands and hair completely, and face the cover downward.
- ●Do not open the camera on the beach or aboard a boat where ocean spray can penetrate the camera.
- ●Never use organic solvent-based cleaners, thinner, or alcohol. These can damage the camera casing or parts which are mostly made of plastic.
- ●Always examine the O-rings for cuts, scratches, debris, or deformity. Replace them if imperfect.
- ●Turn off the strobe when not in use. Do not leave the switch in the "ON" position for long periods of time.



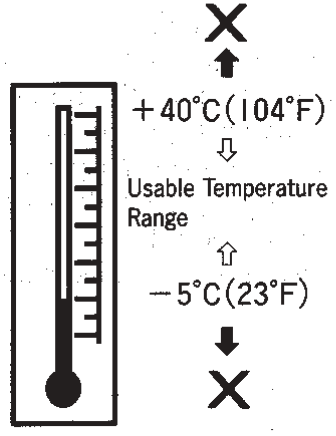
- ●Never leave the camera on the dashboard of a car or in other places where the temperature in high, as in direct sunlight. If you leave the camera with theback cover closed up tight, pressure inside the camera will go up. This may produce defomity of the camera casing or warping of the back cover, which can result in water leaking in or dew condensation, and can cause the camera to sink to the wea bottom.
- ●Store the camera in a dry environment.
- ●When not using the camera for long periods of time, take the batteries out before storing it.
- ●The camera incorporates high-voltage circuits which are dangerous. Never attempt to dismantle the units.

* The exterior and specifications of this unit are subject to change without notice.

CAUTION

USE THIS CAMERA BETWEEN −5°C/23°F AND 40°C/104°F. THE CAMERA MAY NOT FUNCTION ABOVE OR BELOW THIS TEMPERATURE RANGE.

USABLE TEMPERATURE RANGE	−5°C～+40°C 23°F～104°F
STORAGE TEMPERATURE RANGE	−10°C～+50°C 14°F～122°F



AFTER-SALES SERVICE AND GUARANTEE

1. If you want any reparis on the camera, please contact your local dealer. Include any damaged film, prints, or a detailed written description of problem. This will be very helpful for repairs.
2. During the guarantee period (1 year after the purchase), please include your warranty card (containing the name of your dealer and the date of purchase). Without your warranty card, you may be charged for repairs even during the guarantee period. Never remove the serial Number seal (which represents manufacturing number seal).
3. Generally, repairs will be charged after the guarantee period. Read your warranty card for further detail.
4. Because this unit is used under strict conditions, service once a year is recommended.