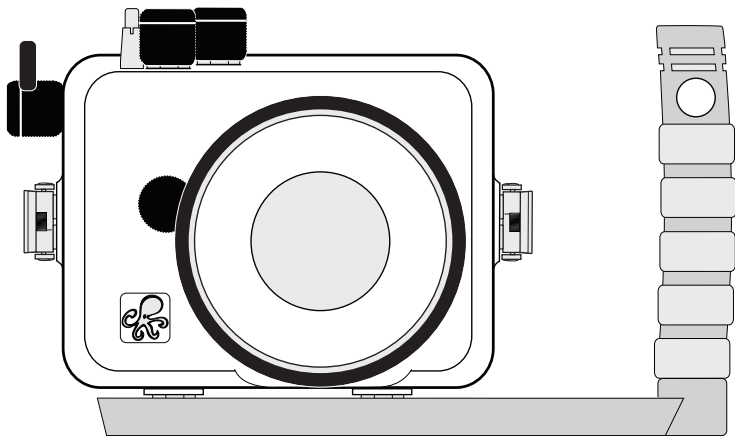




TTL Underwater Housing

Instruction Manual

6171.10 Panasonic Lumix LX100



Thank you for your purchase of Ikelite equipment. Please read this instruction manual completely before attempting to operate or dive with this product. Please refer to the back page of this manual to register your Ikelite product.

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Preparation

This product has been water pressure tested at the factory and is depth rated to 200 ft (60 m). Thoroughly inspect and immerse the empty housing completely in water before installing a camera. If any fogging occurs or droplets of water enter the housing, do not install a camera. Clean the main housing o-ring and retest to make sure that it is watertight. Refer to the Troubleshooting section, page 23.

Please read your camera manual thoroughly to have a full understanding of each camera function.

If you are new to underwater photography, be sure to read the Photo Tips section, page 22.

Specifications (no camera installed)

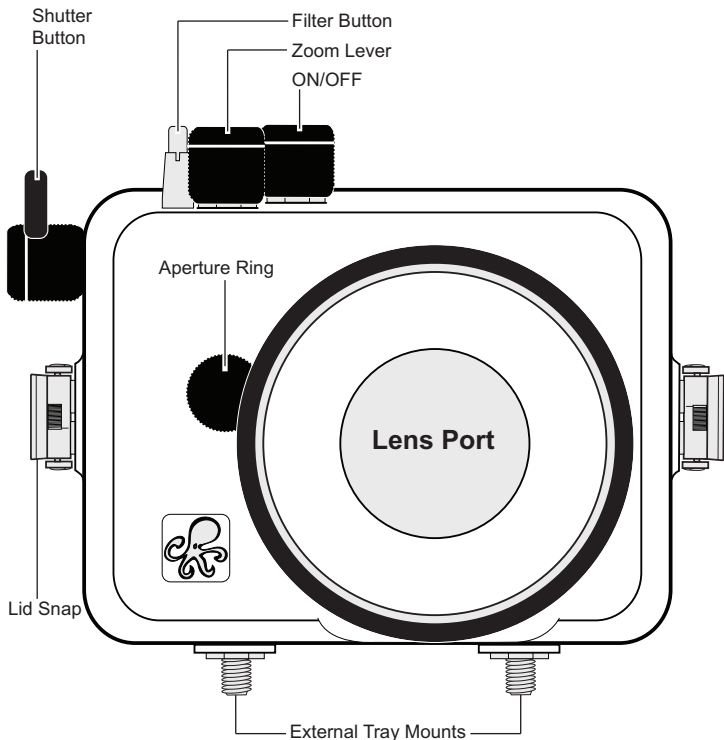
Controls	Controls for all camera functions except Diopter Adjustment Dial, Aspect Selector Switch, Front Control Ring, and Focus Selector Switch
Buoyancy	Near neutral buoyancy in freshwater
Depth Rating	200 ft (60 m)
Strobe Connection	Ikelite Digital TTL 5-pin Electrical Bulkhead plus TTL circuitry compatible with current model Ikelite DS strobes
Built-in Flash	None
Tray and Handle Weight	11.5 oz (327 g)
Main O-Ring	0110
Housing Dimensions	7 x 6 x 6 in (18 x 15 x 15 cm) including projections
Housing Weight	4.7 lb (2.1 kg)
Flat Port Lens	Optical grade 3.9-inch glass

What's in the Box

- Housing
- Waterproof Bulkhead Cap (on External Strobe connector)
- Tray with Quick Release Handle
- Port Cover
- Silicone Lubricant 1cc Tube
- Aperture Ring Gear

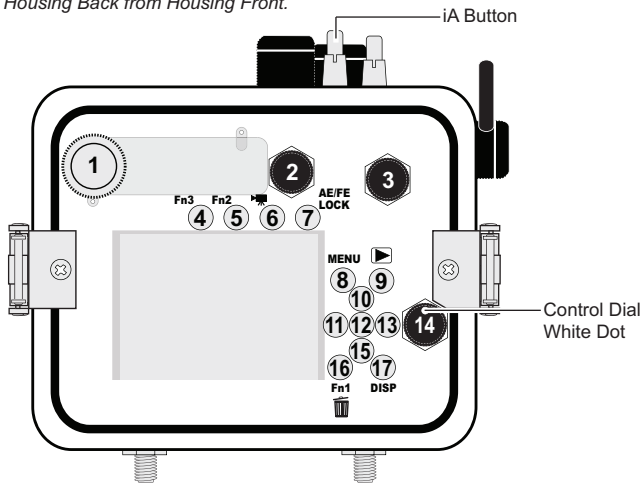
Parts of the Housing - Front View

Housing controls are provided for all camera functions except the Diopter Adjustment Dial, Aspect Selector Switch, Front Control Ring, and Focus Selector Switch



Parts of the Housing - Back View

* Control Dial: Note that a small section of the rubber disc is missing at the end of this control. This is normal and allows the user to completely disengage the control from the camera when not in use. To disengage Control Dial from camera, rotate Dial to 6 o'clock position. Rotate Control Dial White Dot to 12 o'clock position when attaching or removing Housing Back from Housing Front.



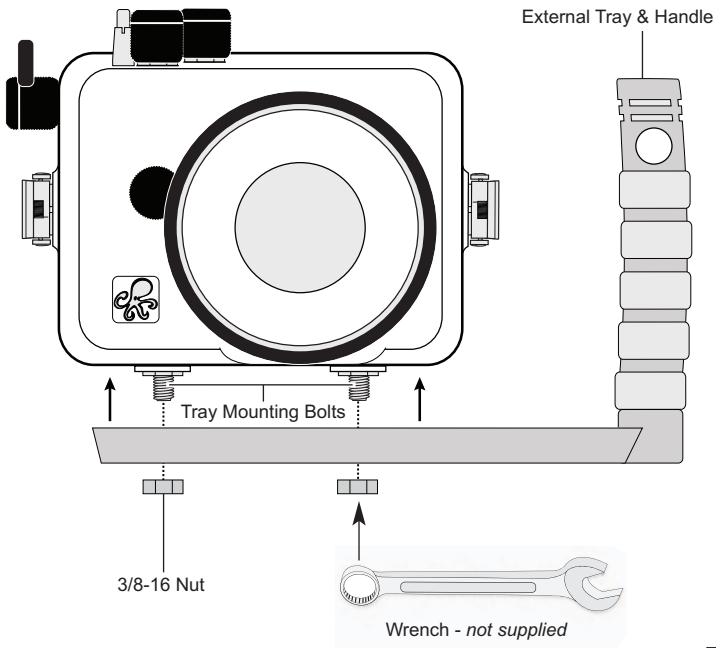
- | | |
|--------------------------------|---------------------------------|
| 1. External Flash Connector | 10. ▲ ISO / UP |
| 2. Shutter Speed Dial | 11. ◀ AF Mode / LEFT |
| 3. Exposure Compensation Dial | 12. MENU/SET |
| 4. Fn3 Button | 13. ▶ White Balance / RIGHT |
| 5. Fn2 Button | 14. * Control Dial |
| 6. Motion Picture Button | 15. ▼ Drive Mode / DOWN |
| 7. AF/AE Lock Button | 16. Fn1/Delete Button |
| 8. Q. MENU Button | 17. DISP. Display Button |
| 9. Playback Button | |

Housing and Camera Setup

STEP 1 - Attach Tray and Handle to the Housing






Using a 9/16" open/box end or socket Wrench (*not supplied*), firmly tighten the External Tray to the Housing Base using the two 3/8-16 Nuts supplied in the accessory package.

Note: Tray and Handle may be attached before or after the camera is secured in the Housing. We recommend attaching it immediately to avoid scratching table tops with the Tray Mounting Bolts.



STEP 2 - Initial Camera Settings (before placing camera in housing)

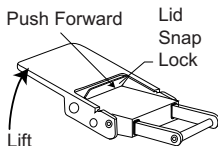
Setup your camera for underwater use and then adjust your settings once underwater.

- Read your camera owner's manual completely to familiarize yourself with all the camera functions.
- Insert a fully charged camera battery and SD memory card.
- Turn camera on. Press "iA" Button to select "M" Manual shooting mode.
- Set Shutter speed to 1/60th second. For fast moving subjects, shutter speed can be set to a maximum of 1/250th second when using a strobe. Set aperture to F5.6, or F16 for macro photography (close-ups).
- Set ISO to "200" and Aspect Ratio to 4:3 or other desired setting.
- **In  REC MENU:**
Set Picture Size to "L", AF to "AFS" AF Single, and AF Mode to "1-Area."
Set Metering Mode to  "Center Weighted."
Set iDynamic and iResolution to "Standard" or other preferred setting.
Set Red-Eye Removal to "Off."
Set Stabilizer based on your shooting habits and environment.
- **IN  C MENU:**
Set Shutter AF to "ON" and Half Press Release to "OFF."
Set Quick AF to "ON" and Eye Sensor AF to "OFF."
Set AF Assist Lamp to "OFF" and Focus/Release Priority to "FOCUS."
Set Auto Review Duration Time to "5SEC."
- **IN  MENU:**
Set Clock and Time. Format "Initialize SD Card."
Set Image Quality to "L" 18M and Image Review to "8 sec."
Set White Balance to "AWB." For best results when not using a strobe, use manual  Custom White Balance and reset for each working depth.
- * *All other camera functions not mentioned should be set to the user preference.*

STEP 3 - Opening the Housing

Lid Snaps have a **Lock**.

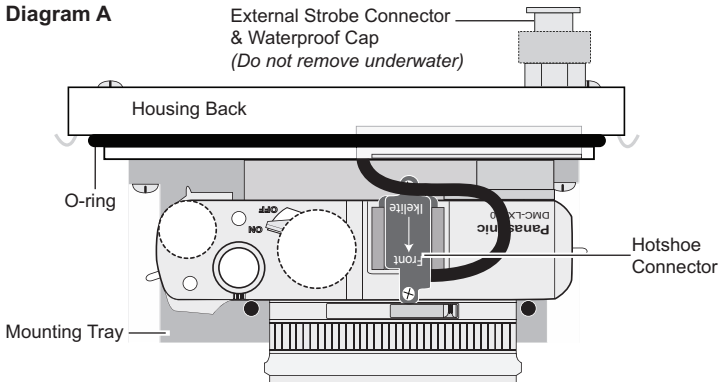
1. Push Lid Snap Locks forward and lift as shown. Open opposing Lid Snaps simultaneously. Keep pressure on the Lid Snaps so they do not fly open quickly. *Some Lid Snaps have a lot of spring tension once they go over center, so keep a firm grip on each Lid Snap. Lid Snaps may also be opened one at a time.*
2. Remove the Housing Back.



STEP 4 - Attach Hotshoe to Camera

1. The Mounting Tray for the camera is secured to the housing back. Position the camera above the Mounting Tray.
2. Slide and push the housing Hotshoe Connector forward into the Camera Hotshoe Mount until it stops, **Diagram A**. Make sure the Hotshoe is all the way forward in the Mount. This should be done **before** the camera is secured with the mounting bolt.

Diagram A



STEP 5 - Attach Camera to Mounting Tray

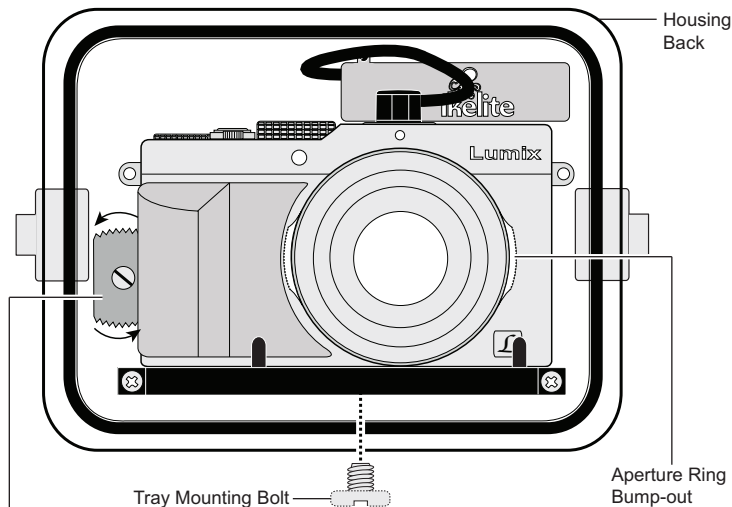
1. Using a coin or screwdriver (preferred), secure the camera with the Tray Mounting Bolt which threads into the camera's tripod socket, **Diagram B**.

⚠ CAUTION:

Do not cross thread or overtighten the Tray Mounting Bolt as you may damage the camera tripod socket threads.

2. * Control Dial "cut away." Rotate control to match **Diagram B** below. This allows for proper clearance when attaching the housing back to the housing front.

Diagram B

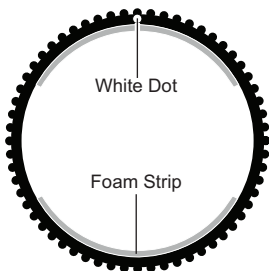


* Control Dial "cut away." Rotate as shown when attaching housing back to housing front. Control Dial White Dot will be in the 12 o'clock position. When not in use, rotate Control Dial white dot to the 6 o'clock position so "cut away" is over the camera dial and not contacting the camera.

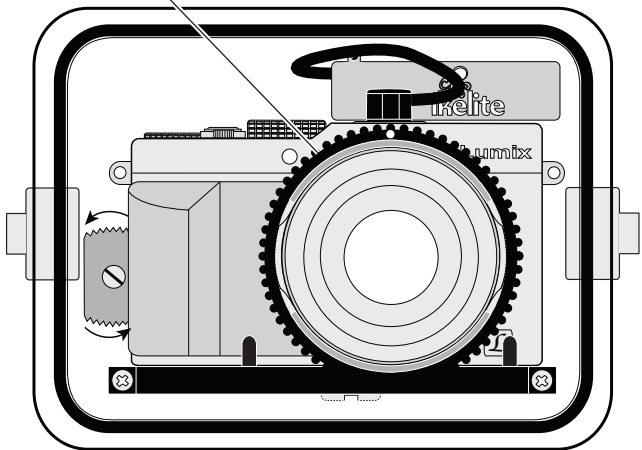
STEP 6 - Attach Aperture Ring Gear to Lens

1. Rotate camera Aperture Ring so the Bump-outs, **Diagram B**, Page 10, line up between the Aperture Ring Gear Foam Strips, **Diagram C**.
2. With the white dot at the 12 o'clock position, gently slide the Aperture Ring Gear over the camera Aperture Ring. The camera's Aperture Ring Bump-outs go between the the Aperture Ring Gear foam strips. The Gear is a "press fit" over the lens. When properly installed, the Foam Strips will be flush with the Aperture Ring Bump-outs, **Diagram D**.
3. Rotate Aperture Ring Gear back and forth to test function.

Diagram C



Aperture Ring Gear
(properly installed) **Diagram D**

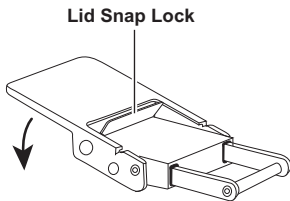
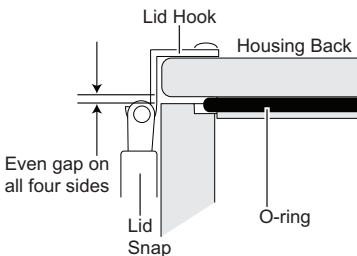


STEP 7 - Installing Camera in Housing

1. Pull out on each housing control until it stops. This will get the controls out of the way for installation of the camera. Make sure the Movie Button knob is pulled out and the control is facing toward the bottom of the housing.
2. Remove camera lanyard from camera if attached.
3. Place the Housing Front face down in your lap.
4. Gently guide the Housing Back with camera attached into the Housing Front at a slight angle so the Aperture Ring Gear and Housing Gear engage properly. Visually check to see that the Gears are properly engaged and test their function.

STEP 8 - Closing the Housing

1. Once the back is properly installed, the o-ring should touch the housing all the way around. There should be an even gap on each side of the housing between the housing and the back.
2. Lift the lid snaps so they are extended and place each lid snap into the corresponding hook on the housing back.
3. To close the housing, push down on the opposing lid snaps simultaneously until they snap into place. Be sure they are down far enough to engage the **Lid Snap Lock**. The o-ring seal should now appear as a solid black line from the back of the housing.



STEP 9 - Final Housing Check

The clear housing permits instant visual inspection of the camera and sealing surfaces as well as complete monitoring of controls and camera LCD screens. This housing has been factory water pressure tested to 200 ft (60 m).

Once the housing is closed, recheck the o-ring seal. Double check the gap between the housing back and the housing. It should be even all the way around the housing.

Look through the clear plastic back at the o-ring. You should see a darkened area or solid black line where the o-ring is compressed against the housing back. If you do not see an even black compression seal all the way around the back, open the lid snaps, reseal the housing back and close the lid snaps. Visually check the seal again.

Strobe Compatibility

- AF35.....no
- DS50.....yes, above serial number 70000
- DS51.....yes
- DS125.....yes, above serial number 5000
- DS160, DS161yes
- DS200.....yes, above serial number 7163
- Non-Ikeliteyes, manual flash exposure only

Ikelite Housing Conversion Circuitry

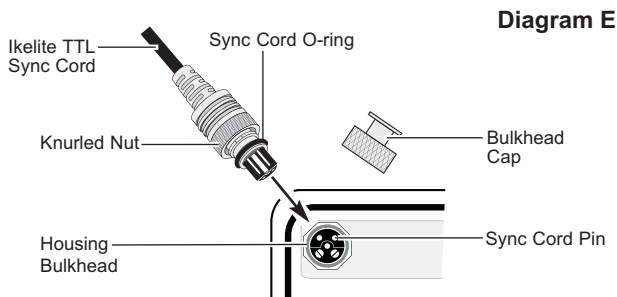
This small compact housing has Ikelite designed and patented Conversion Circuitry built right in. The Conversion Circuitry provides real TTL flash exposure when used with Ikelite DS series strobes. Once a DS series strobe is attached to the External Strobe Connector, the conversion circuitry is automatically powered after the strobe is turned on. Once attached, turn the strobe on first before turning on the camera. The circuitry cannot be powered up or used by non-Ikelite strobes, however, non-Ikelite strobes can be fired manually with the correct cord.

Attaching a Sync Cord to the Housing - Diagram E, Page 15

The Housing Bulkhead Connector is designed to accept sync cords with Ikelite 5 pin connector fittings.

1. Lightly lubricate the Sync Cord O-ring. Use ONLY Ikelite lubricant (supplied with housing).
 2. Remove Bulkhead Cap from Housing Bulkhead.
 3. Line up the Sync Cord Pins with the corresponding Bulkhead Receptacles. Gently insert Sync Cord into Bulkhead. **DO NOT** force this installation. *If the Sync Cord does not seat properly inside the Bulkhead, then the Pins and Receptacles are improperly aligned (repeat Step 3).*
 4. Tighten the Knurled Nut snugly using your Index finger and thumb. **DO NOT** use pliers or other tools to tighten the Knurled Nut.
- Always remove the Sync Cord from your Housing when not in use and replace the Bulkhead Cap.

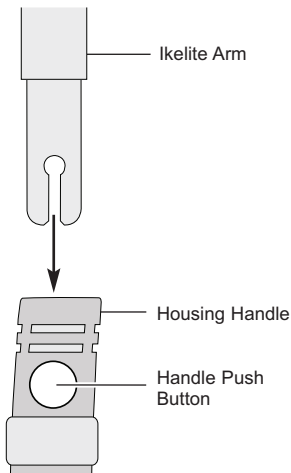
Attaching a Sync Cord to the Housing - Diagram E



Attaching an Ikelite Strobe Arm to the Housing Handle

To attach an Ikelite Arm to your Housing Handle, depress the spring-loaded Handle Push Button until it stops. Gently slide the pronged end of the Ikelite Arm into the hole in the top of the Handle as shown, **Diagram F**. When the Ikelite Arm is properly seated, the Handle Push Button will return to its starting position.

Diagram F



Entering the Water

As soon as you enter the water, take a moment and check to see that the housing is properly sealed. We recommend you first water test the housing with **no camera inside** to assure a safe and watertight environment.

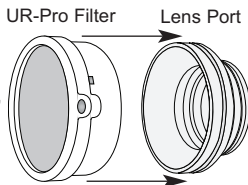
Next, check to see if there are any bubbles on the face of the lens port. If there are, take your finger and remove them. If there are bubbles on the lens port they can produce soft focus spots in your photos or video.

Recommended Accessories

External Color Correcting UR/Pro Filters (Blue Water or Green Water)

Color filters such as the UR-Pro Filter replace some of the reds, oranges and more natural tones that would otherwise be lost underwater. Effective in relatively shallow, sunny conditions, and available for tropical blue water and green water settings. For optimum results use in combination with custom (manual) white balance.

For available light use only. Not recommended when using external strobes.



WD-4 Wide-Angle Conversion Dome 6430.4

The removeable WD-4 corrects light refraction underwater, restoring the camera's original angle of coverage. Approximately 3/4 of the camera's zoom range from the camera's widest angle setting can be used with the dome in place. Slight vignetting may occur at camera's widest angle setting.



Recommended Accessories - continued

External Macro Adaptor 9306.82



Allows attachment of 67mm threaded macro lenses from Inon and Epoque. NOT for use with 67mm threaded wide-angle lenses.

Note: Other than the 6430.4 and 9306.82, no other accessory lenses or adaptors can be used with this housing.

Tray + Dual Handles 9523.64

Add stability and gripping point(s) for comfortable use of the housing.

Add a second strobe to eliminate shadows and evenly light your subjects.

DS161 Strobe, Sync Cord + Ball Arm Mark II Kit

The Panasonic LX100 camera **does not** feature a built-in flash. We recommend a DS161 Strobe Kit to combine power with wide angle coverage to adequately light your subjects. The DS161 quality of light is exceptional due to a round flash tube and custom powder coated reflector designed specifically to deliver the softest, most even coverage possible. Add a second DS161 to eliminate shadows and provide balanced lighting.

Video Lighting

External video lights such as the 2101 Vega Video + Photo Light add color when using the video/movie mode of your camera. Primary video lights are specially color balanced to provide natural tones.

Additional Accessories

- 2602.3 Quick Release Handle Kit for GoPro
- Gamma LED Flashlight

A full range of accessories are available to support your housing. Please visit **www.ikelite.com** to see the most current information about recommended accessories for your housing.

Maintenance

Lens Port

Treat the glass in the lens port as a camera lens. After use, rinse and gently dry the outside lens port to avoid water spotting. To clean, use a mild soap solution or lens cleaner. It is NOT necessary to remove the Port for cleaning. Do not rinse inside the Port.

Do not use alcohol or window cleaner on the Lens Port.

Lubricant

Ikelite provides silicone lubricant with the housing. We recommend you use **only** Ikelite lubricant on Ikelite products. Other brands may cause the main housing o-ring to swell and not seal properly.

Use only enough lubricant to lightly cover the main housing o-ring or lubricate a sticky control. Wipe off any excess lubricant with a clean cloth. Lubricant is not a sealant; it is used to reduce friction. Excessive lubricant can collect sand and dirt which may interfere with proper sealing.



CAUTION:

Never use spray lubricants as the propellant ingredient can cause the plastic housing to crack or o-rings to swell.

Housing Maintenance

Your Ikelite Digital Housing should be given the same care and attention as your other photographic equipment. In addition to normal maintenance, we recommend that the housing be returned to Ikelite periodically to be checked and pressure tested.

- **Do Not** leave the camera and housing in direct sunlight for prolonged periods. Heat may damage the camera.
- **Do Not** ship the camera in the housing.
- Before using the housing, always check the tightness of the **set screw** in each control knob. Check each **control gland** penetrating the housing to make sure they are tight. There is a slight chance that either could vibrate loose during travel.
- Keep the main housing o-ring clean and lightly lubricated. To lubricate, remove the o-ring from the back. Put a small amount of Ikelite lubricant on your fingers. Pull the o-ring through your fingers to apply a **thin** coating of lubricant. Only apply enough lubricant to make the o-ring feel slick. **Do Not stretch the o-ring**. This light coating of lubricant will help to keep the o-ring from drying out and will help to show a dark sealing line when the housing back is properly sealed.
- Keep the area where the o-ring fits and the sealing surface of the housing clean.
- Rinse the housing exterior thoroughly in freshwater after each saltwater use. Depress push buttons repeatedly in freshwater to eliminate trapped saltwater. Dry with a soft cloth. Dry lens port to eliminate water spotting. After several uses in saltwater, soak the housing exterior in a mild soap solution; rinse and dry before storing. When storing the housing, remove the back o-ring, lightly lubricate, and place in a plastic bag. Place the plastic bag with o-ring inside the housing for safe keeping.
- If removing a housing push button, **Do Not** re-use the E-clip. Contact Ikelite for replacement E-clips (part 0319.12).
- Leave lid snaps in the open position when not using the housing for extended periods.

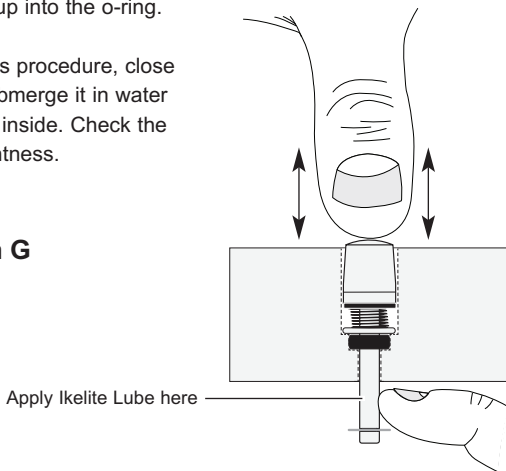
Control Maintenance

Ikelite controls are designed to provide years of reliable service with minimal maintenance.

- Push button controls normally require no maintenance other than rinsing in freshwater after saltwater use. Depress each push button in freshwater several times to eliminate trapped saltwater. If a push button control becomes difficult to push or if it sticks when depressed, soak the housing in luke warm freshwater. After a few minutes, operate the push button. If this does not correct the problem, return the housing to Ikelite for maintenance. If you are on a trip and unable to return the housing immediately, a push button may be lubricated by pressing and holding the push button all the way in. Then, use your finger or other small non-metal object to place a small amount of lube at the base of the shaft inside the housing. Press and release the push button several times until the lube is worked up into the o-ring.

After completing this procedure, close the housing and submerge it in water without the camera inside. Check the control for watertightness.

Diagram G



Control Maintenance - continued

In the unlikely event one of the larger gland style control shafts sticks or becomes difficult to operate, you can remove the control from the housing and lubricate it, or return the housing to Ikelite for maintenance. To remove the control, **Diagram H**, loosen the set screw in the knob (allen wrench required); remove the knob. If there is salt or dirt build-up on the exposed control shaft, clean the shaft. Open the housing and gently slide the control shaft out of the control gland. Clean and lightly lubricate the shaft, including the end of the shaft.

Slide the shaft back into the control gland and gently slide it back and forth a few times without fully removing the shaft from the gland.

Replace the knob, noting the flat area on the shaft. The set screw in the knob should tighten down against the flat area on the control so the knob does not turn on the shaft.

After completing this procedure, close the housing and submerge it in water without the camera inside. Check the control for watertightness.

Diagram H

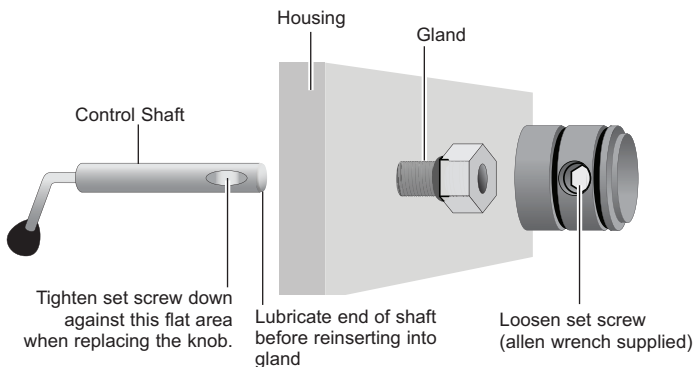





Photo Tips

- The number one rule in underwater photography is to eliminate as much water between the camera and subject as possible. Get as close as you can to the subject, then use the zoom. If you are using flash for still photos, subjects beyond 6 ft (1.8 m) will not have much color regardless of strobe power.
- Photograph in clear water; do not stir up the sand or silty bottom. If backscatter becomes a problem in the environment you are photographing, an external flash will help eliminate much of the backscatter.
- Many digital cameras have a slight lag time between when you press the shutter release button and the camera actually takes the picture. Hold the housing steady a second or two after pressing the shutter release button.
- Do not shoot down on subjects as they will quite often blend into the background and be difficult to see in the photograph. Shoot subjects straight on or shoot up at a slight angle using the blue water as a contrasting background.
- When using daylight or flash, if your camera consistently over or underexposes the image, you may want to adjust your camera's exposure compensation  or flash exp. comp.  settings.
- If you error in exposure, it is better to have the image slightly underexposed rather than overexposed. An overexposed image is missing color information which cannot be adjusted in a photo processing program. A slightly underexposed image has color information that can be adjusted.
- It is important to respect all living creatures underwater, including people, marine life, and coral. While we encourage people to get close to their subjects when taking a photograph, they should not touch, lie on, or in any way disturb the things they find underwater.

Troubleshooting

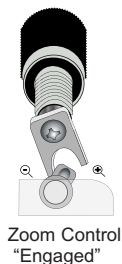
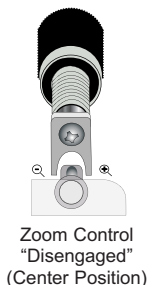
Problem	Solution
Push buttons or controls are sticky or hard to operate	<ul style="list-style-type: none"> - Remove the camera and rinse the closed housing in freshwater. Vigorously press each push button in and out several times to release any trapped saltwater or debris. - Press a sticky push button all the way in and place a small amount of lube on the small end of the push button shaft at it's base. Release and operate the push button several times to distribute the lube, Diagram G, Page 20. - If a larger gland style control is sticky, grab the control knob, pull it out, and then push back in. If still sticky, see the Control Maintenance section, Diagram H, Page 21. - Return housing to Ikelite for routine maintenance.
Image is over/underexposed, or a corner of the image is dark	<ul style="list-style-type: none"> - When using an external strobe, make sure it is turned on, set properly, and its battery is charged. - Check all corded connection points. - Change camera shutter speed or aperture. - Move closer to or further away from the subject. - Adjust Flash Exposure Compensation ⚡ .

Problem	Solution
Camera does not take a picture	<ul style="list-style-type: none"> - Install a fully charged battery. - There is not enough available light for the camera to properly focus. Add a focusing light, or strobe with a built-in focusing or video light, to your system. - Select a center focus point in your camera menu. - Return Zoom control to the “disengaged” position, see Zoom Control, Page 25.
Housing is hard to close	<ul style="list-style-type: none"> - Make sure the camera is mounted properly in the housing and controls are out of the way. - Main housing o-ring is not seated properly. - Aperture Ring Gear is not engaging housing gear properly.
Fogging occurs on the Lens Port	<ul style="list-style-type: none"> - Humid air is trapped inside the housing. The camera produces heat and may condense any trapped moisture forming fog on the lens port. Close the housing in an air-conditioned room or vehicle, or in front of an air-conditioner. - The housing should not be in direct sunlight for an extended period of time. - Purchase desiccant packs also known as moisture munchers from a local camera store. Place one or two new packs in your housing before each day of diving. - If moisture or water droplets are present around the controls or sealing areas, return the housing to Ikelite for evaluation. - Clean the main housing o-ring and sealing surface of the housing.

Problem	Solution
Water enters the housing	<ul style="list-style-type: none"> - Remove, clean and properly lubricate the main o-ring. - Look for hair, dirt, or foreign debris crossing the o-ring seal. - Reassemble the housing without a camera installed and immerse in water. - Return housing to Ikelite for evaluation.
Pictures are too blue or too green	<ul style="list-style-type: none"> - Use custom (manual) white balance. Reset for each working depth or when attaching a color correcting filter to the camera lens. - Add an external strobe. - Move in closer to your subject when taking a picture. - Add an optional color correcting filter to the Housing Port.

Zoom Control

After you have used the housing's zoom control, it must be returned to the center position to disengage. If the housing zoom control is pushing the zoom lever in either direction, you may not be able to take a picture or access other functions. This is because the camera is receiving a signal from the engaged zoom control.



Spare Parts (available through Ikelite or any Ikelite Dealer)

- 9104.5 Waterproof Bulkhead Cap
- 0184.2 Silicone Lubricant Resealable 2cc Tube
- 0132.30 Port o-ring
- 0200.08 Port cover
- 0110 Main o-ring
- 0945.18 allen wrench for control knobs

Customer Support

Please read the troubleshooting section of this instruction manual before contacting Ikelite Customer Support.

**Ikelite Underwater Systems
Service Department
50 West 33rd St.
Indianapolis, IN 46208 USA**

Email: ikelite@ikelite.com

Phone: 317-923-4523

Limited Warranty

This Ikelite product is warranted against any manufacturing defects for a period of one (1) year from the original date of purchase. Defective products should be returned to Ikelite postage paid. Ikelite will, at its sole discretion, repair or replace such products, and will return to customer postage paid. All other claims of any nature are not covered. Except as mentioned above, no other warranty expressed or implied applies to this Ikelite product.

Returning Products For Service

Ikelite is most interested in performing any service to ensure that all products perform as intended. Evidence of purchase date must be provided to obtain warranty service.

No prior authorization is required. You may return directly to us or through your dealer. Please include a brief description of the problem, any relevant email correspondence, and/or instructions on what you want us to do. Always include name, shipping address, email address, and phone number inside of the package. Send postage paid to:

Ikelite Underwater Systems

Attention: Service Department

50 West 33 Street

Indianapolis, IN 46208 USA

No reimbursements for postage paid will be issued.

You may also want to insure the package.

Returning Products for Service - outside the United States

For the separate international customs documentation form that you complete to accompany the shipment, please state or designate that the enclosed products were originally manufactured in the USA and are being returned to the manufacturer for repair service. Value of the equipment listed for customs purposes should be zero.

Product Registration

Please go to **www.ikelite.com** to register your Ikelite housing within 15 days of purchase.



**Ikelite Underwater Systems
50 West 33rd Street
Indianapolis, IN 46208 USA**

www.ikelite.com