

PN 87301 EMWL Set #1
PN 87302 EMWL Set #2
PN 87303 EMWL Set #3
PN 87226 EMWL 160° Objective Lens

User Manual

Underwater Optics

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INTRODUCTION

Thank you for purchasing this Nauticam product.

Before using the product, please read this manual thoroughly to familiarize yourself with full scope of functions on the product as well as ensuring that you will use the product correctly.

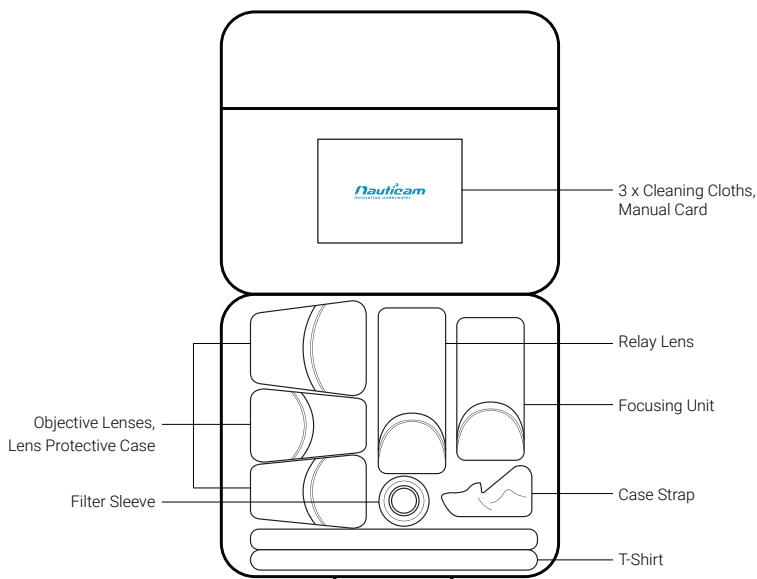
PACKAGE CONTENTS

Make sure that you have all the included items listed below before using this product. If some items are missing or damaged, contact your local Nauticam dealer.

EMWL set packages :

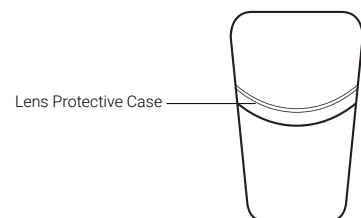
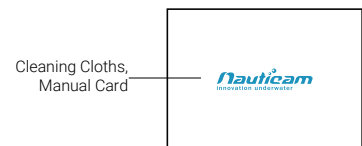
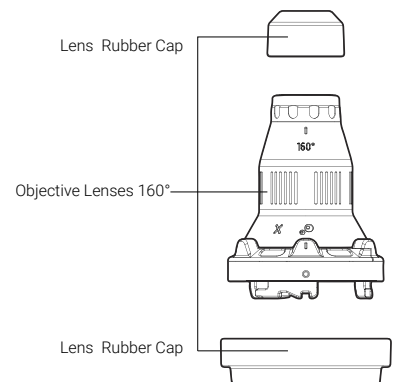
87301 EMWL Set #1	87302 EMWL Set #2	87303 EMWL Set #3
1 x Focusing Unit #1	1 x Focusing Unit #2	1 x Focusing Unit #3

- 1 x Relay Lens 150mm
- 1 x Objective Lens 60°
- 1 x Objective Lens 100°
- 1 x Objective Lens 130°
- 5 x Lens Protective Case
- 1 x Filter Sleeve
- 3 x Cleaning Cloth
- 1 x Nauticam T-shirt
- 1 x Manual Card
- 1 x Nauticam Package Case (with strap)



EMWL 160° Objective Lens packages :

- 1 x Objective Lens 160°
- 1 x Lens Protective Case
- 1 x Cleaning Cloth
- 1 x Manual Card



**all EMWL lens units can be purchased separately*

IMPORTANT INSTRUCTIONS

1

Water-tight test of the housing (without camera inside) along with EMWL before usage is recommended.

2

Do not use any kind of abrasive solution to clean the glass surfaces.

3

Do not expose the housing in direct sunlight for a prolonged period.

4

Do not point of the lens directly towards the sun.

5

Do not sealed the housing system when travelling by air.

6

Defective products should be shipped to our distributors for service. Do not attempt to disassemble and /or modify any part of the lens.

7

Do not open the housing system in wet or sandy environment. Protect the housing and lenses from moisture and debris in order to prevent malfunction or leakage.

8

Prevent any sand or dust or water penetration inside the housing and in between lenses. Be extra careful when changing lens and inserting or removing the camera.

9

The housing setup should be positioned on the a stable and safe surface on land.

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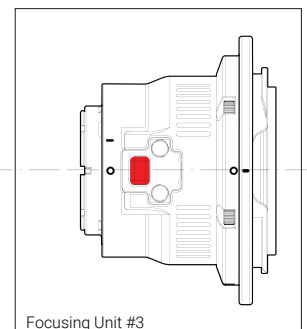
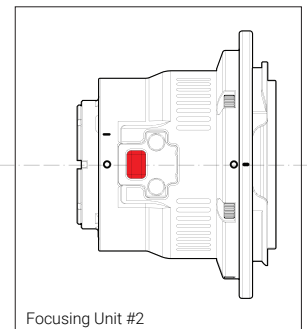
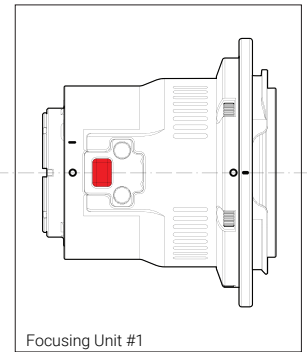
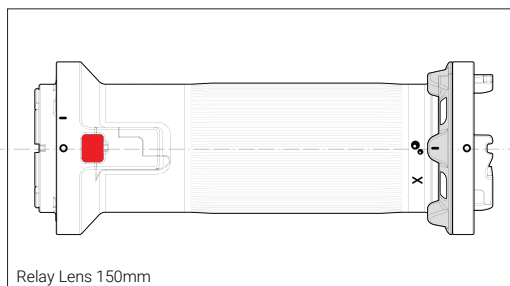
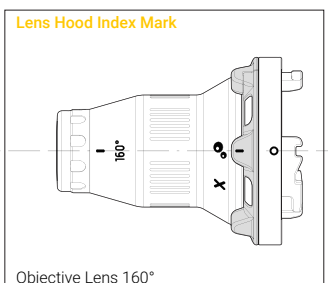
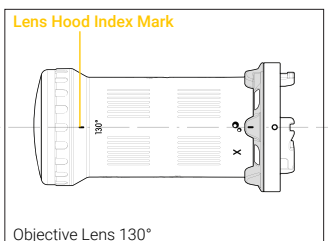
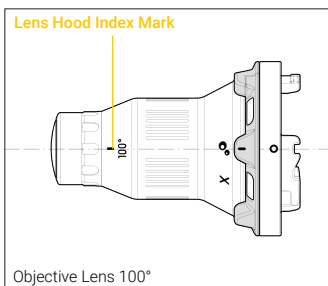
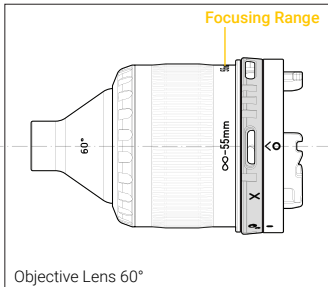
Do not jump in water carrying the housing setup. Always have the setup handed to you when you are in water.








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This product is not intened for use by children, or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are supervised and/ or given instruction by a responsible person concerning use of the product to ensure that they can use it safely.

PART NAMES



-  Lens mount release button
-  Air release ring
-  Air release ring close
-  Air release ring open
-  Lens mount index mark

FUNCTIONS

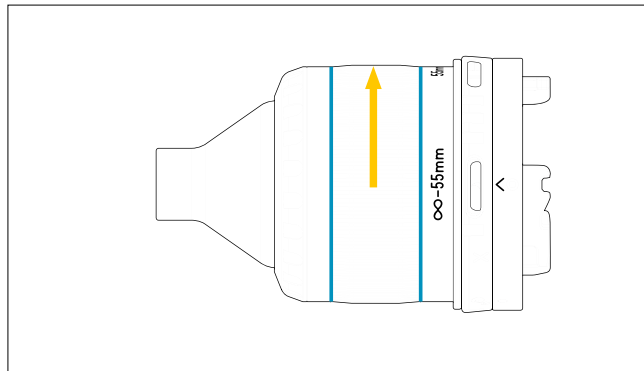
* drawings as illustrations only

Objective Lens 60°

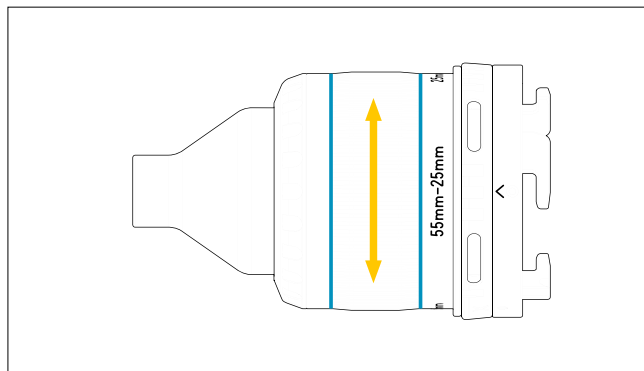
We recommend to set the desire focusing range before approaching the subject underwater.

There are 3 focusing ranges that can be set and adjust in water :

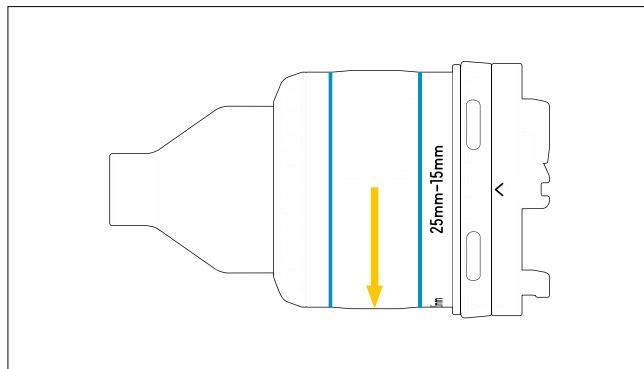
∞ -55mm



55mm-25mm



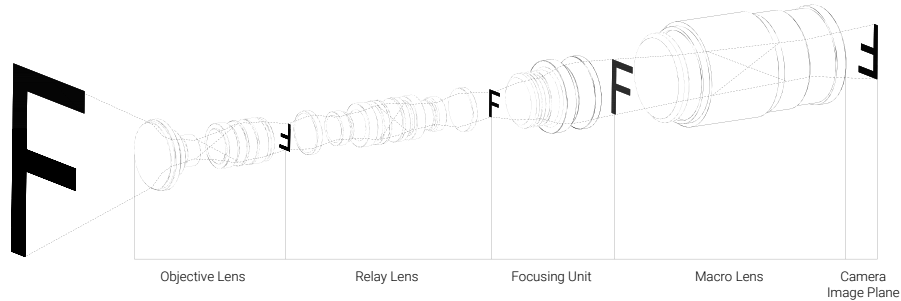
25-0mm



FUNCTIONS

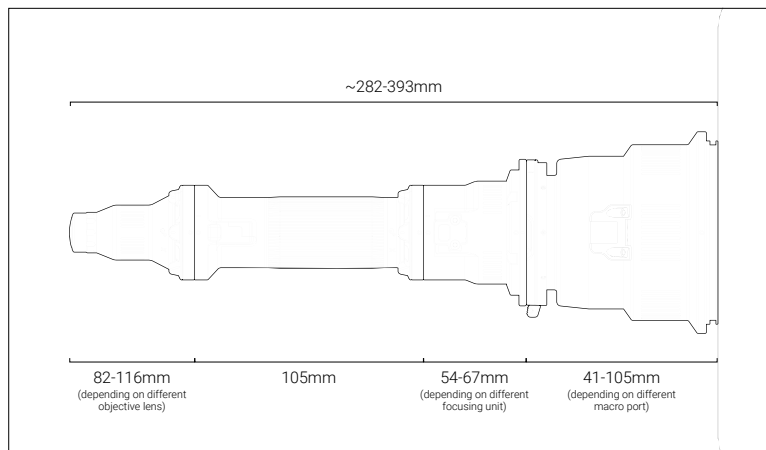
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Relay Lens 150mm



The EMWL objective lenses generate an inverted image, making the image appear upside down. The relay lens corrects the inverted image and relays the image back to the focusing unit and into the camera sensor.

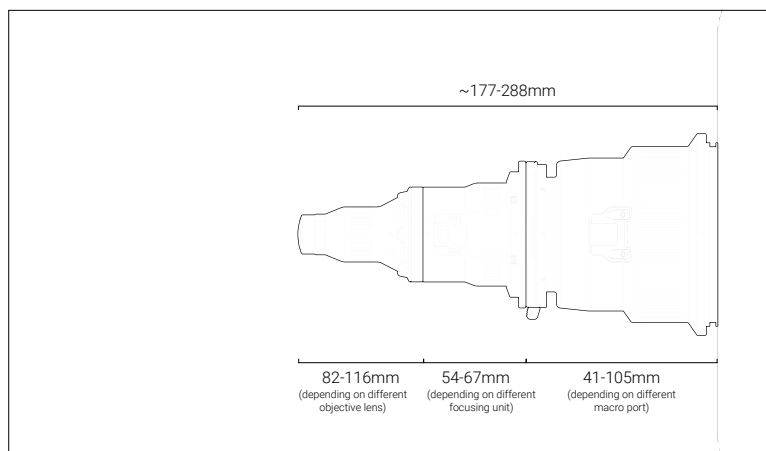
With Relay Lens Setup



The relay lens is 150mm in length and only 62mm at its widest point.

This allows the front of EMWL to be placed extremely close to the subject while keeping the bulk of the camera system and the photographer at an extended distance.

Without Relay Lens Setup



It is possible to use the EMWL without the relay lens if you do not need the extended working distance, but you will want a camera or a monitor that can correct the inverted image in EVF or LCD.

FUNCTIONS

* drawings as illustrations only

Air Release Ring

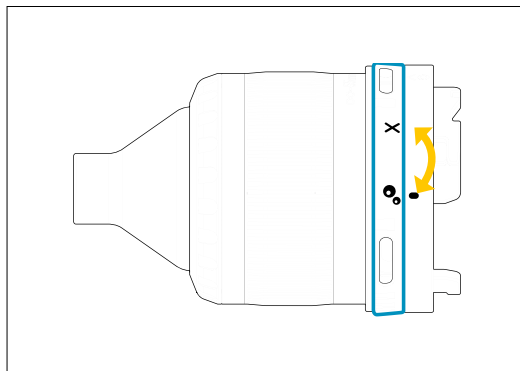
The EMWL modular system is designed for exchangeability underwater, each module can assemble and disassemble in water. When entering the water or each time after interchanging lenses, air bubbles might be trapped in between lenses. The air release ring is to allow water to pass through and therefore releasing the air bubbles.

- * *Interchanging lenses in sandy bottom and murky water is not recommended.*
- * *We recommend to open and close the air release ring only when the water is clear.*

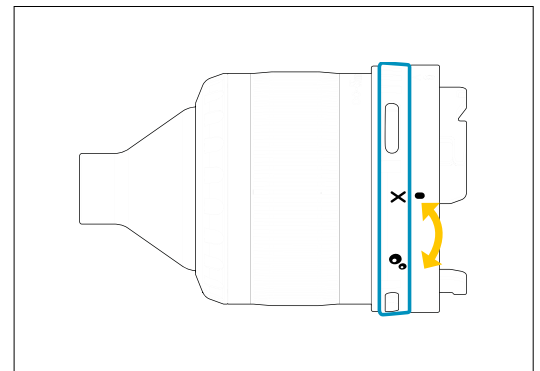
There are 2 types of air release ring :

Type 1 :

Objective Lens 60°



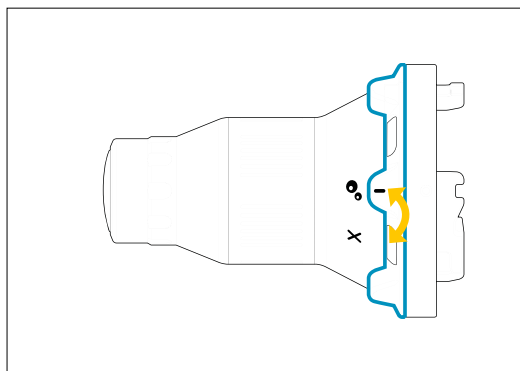
air release ring in open position



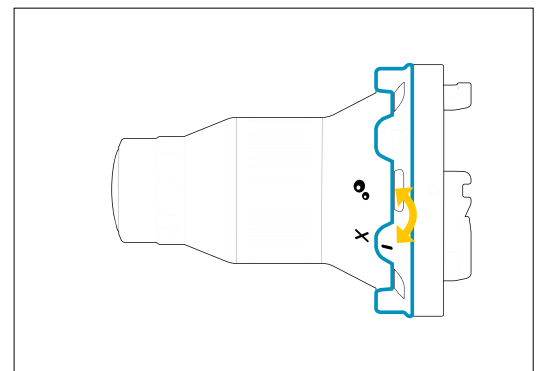
air release ring in close position

Type 2 :

Objective Lens 100°
Objective Lens 130°
Objective Lens 160°
Relay Lens



air release ring in open position



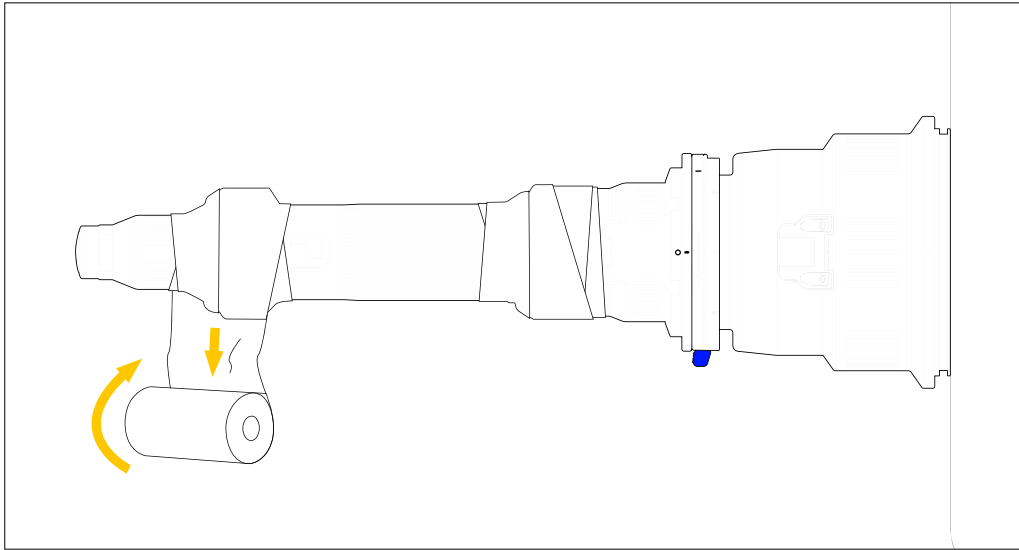
air release ring in close position

FUNCTIONS

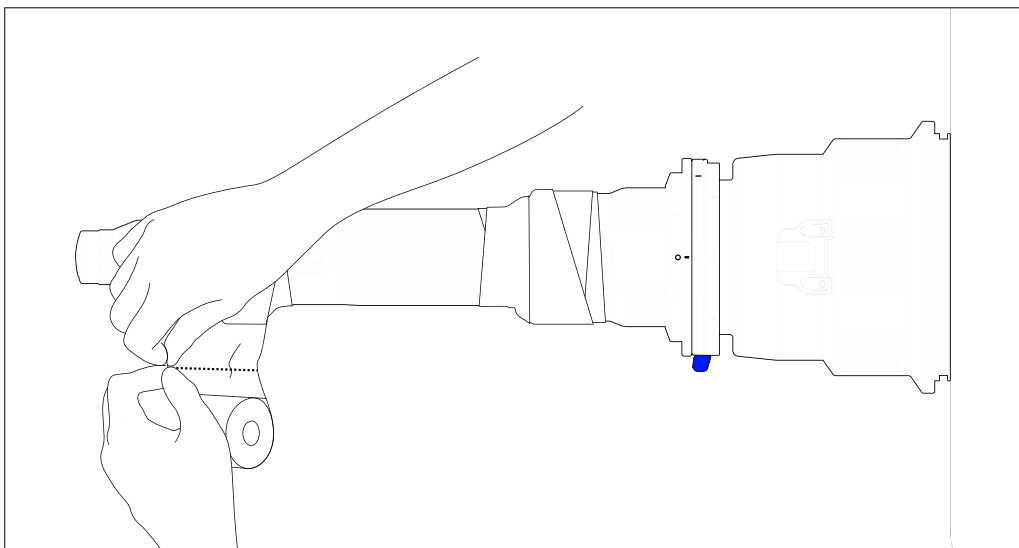
* drawings as illustrations only

Filter Sleeve

To prevent particles being trapped in between lenses in murky water, we suggest to wrap filter sleeve provided over the air release ring before going into bad water condition. The air release ring on/off position can function as usual after wrapping.



wrapping filter sleeve over the air release ring



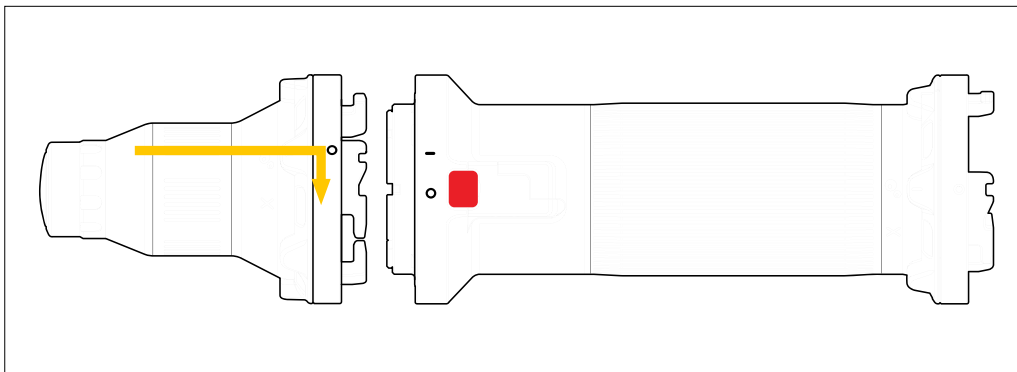
filter sleeve can be peeled off easily by hand

EMWL LENS TO LENS MOUNT

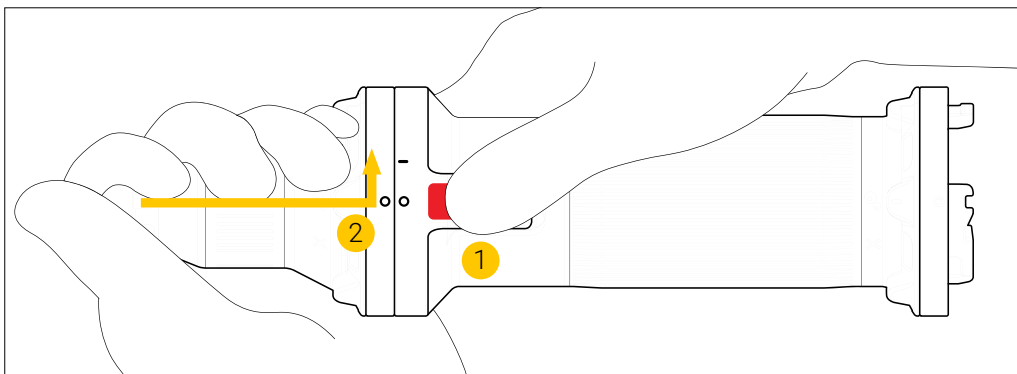
* drawings as illustrations only

The EMWL uses the Nauticam bayonet mounting system for assembling and disassembling.

To Assemble



To disassemble

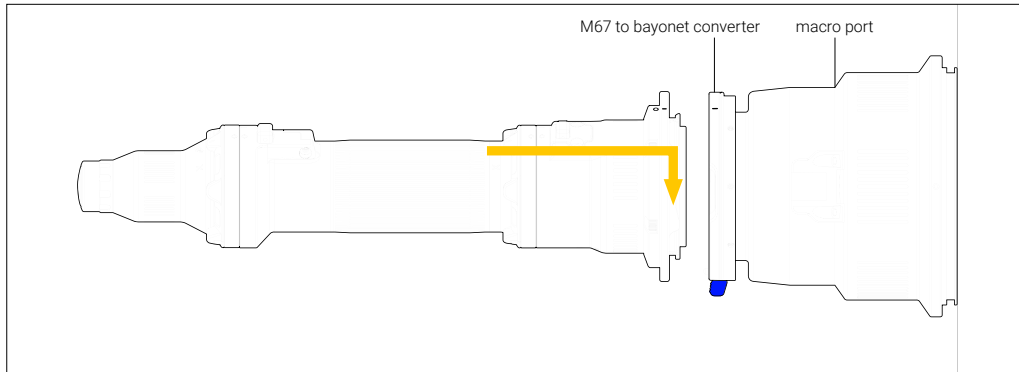


EMWL SYSTEM TO LENS PORT

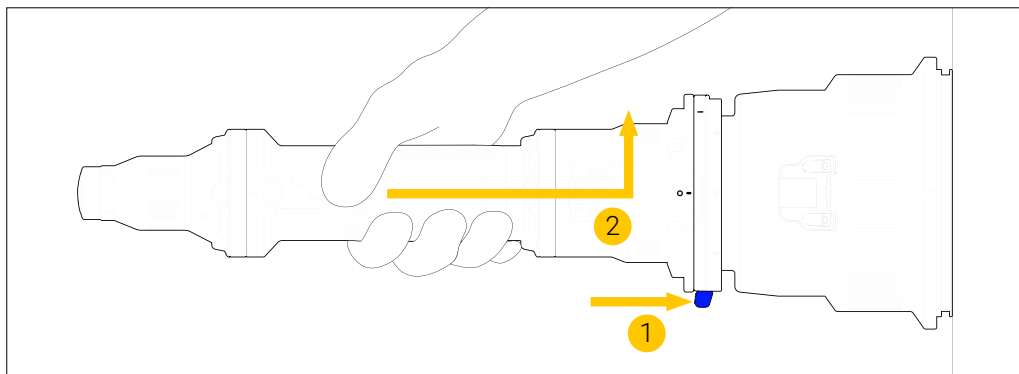
* drawings as illustrations only

Before mounting the EMWL onto the lens port, it is necessary to first attach a M67 to bayonet converter (#83250).

To attach



To remove



SPECIFICATIONS

*For compatible lenses, please refer to EMWL port chart on the website.

Focusing Units	#87201 Focusing Unit #1	#87202 Focusing Unit #2	#87203 Focusing Unit #3
Optical Design	6 elements in 3 groups	6 elements in 3 groups	6 elements in 3 groups
Bayonet	Nauticam bayonet mount	Nauticam bayonet mount	Nauticam bayonet mount
Largest Diameter	96mm	96mm	96mm
Length	83.4mm	71.4mm	66.9mm
Weight	In air 740g / In water 480g	In air 627g / In water 400g	In air 616g / In water 410g
Depth Rating	150m	150m	150m
Lens Body	Hard anodized aluminium alloy	Hard anodized aluminium alloy	Hard anodized aluminium alloy
Lens Coating	Anti-reflection	Anti-reflection	Anti-reflection

Relay Lens	#87211 Relay Lens 150mm
Optical Design	14 elements in 10 groups
Bayonet	Nauticam bayonet mount
Largest Diameter	62mm
Length	164.5mm
Weight	In air 592g / In water 320g
Depth Rating	150m
Lens Body	Hard anodized aluminium alloy
Lens Coating	Anti-reflection

Objective Lenses	#87221 Objective Lens 60°	#87222 Objective Lens 100°	#87223 Objective Lens 130°
Optical Design	9 elements in 6 groups	9 elements in 6 groups	9 elements in 6 groups
Focus Range	15 mm to ∞	15 mm to ∞	10 mm to ∞
Bayonet	Nauticam bayonet mount	Nauticam bayonet mount	Nauticam bayonet mount
Largest Diameter	62mm	62mm	62mm
Length	97.0mm	88.5mm	123.2mm
Weight	In air 378g / In water 260g	In air 218g / In water 130g	In air 510g / In water 290g
Depth Rating	150m	150m	150m
Lens Body	Hard anodized aluminium alloy	Hard anodized aluminium alloy	Hard anodized aluminium alloy
Lens Coating	Anti-reflection	Anti-reflection	Anti-reflection

Objective Lenses	#87226 Objective Lens 160°
Optical Design	10 elements in 7 groups
Focus Range	3 mm to ∞
Bayonet	Nauticam bayonet mount
Largest Diameter	62mm
Length	81.5mm
Weight	In air 235g / In water 145g
Depth Rating	150m
Lens Body	Hard anodized aluminium alloy
Lens Coating	Anti-reflection

Accessories	
# 87501	EMWL Flip Holder
# 83250	M67 to Bayonet Converter II
# 87512	Lens Hood for Objective Lens 130°
# 87513	Lens Hood for Objective Lens 100°
# 87516	EMWL Bayonet Holder for Ø70 Float Arm
# 87517	EMWL Bayonet Holder for Ø90 Float Arm
# 87518	Strobe Mounting Brackets for EMWL Relay Lens

CARE/STORAGE

1

Soak the housing system along with the EMWL in fresh water after salt water usage

2

Operate all controls and buttons at least 3 times while immersed in fresh water

3

We recommend cleaning and inspecting the main O-ring each time after diving for any damage and every time the housing is opened.

4

Protect the housing and lenses with robust and shock-proof travel case during transportation. Do not travel with camera inside housing.

5

We recommend to ship the housing to our service centers for a complete overhaul after 200 dives/every 2 years.

WARRANTY

All NAUTICAM Housing Products and Viewfinders are warranted against any material and manufacturing defects for two years from the date of purchase for consumer use. NAUTICAM Optical Accessories are warranted against material and manufacturing defects for a period of one year, and HDMI cables carry a year warranty.

This warranty only applies to products purchased from authorized NAUTICAM dealers and does not extend beyond the original retail purchaser.

To return your product for service, please contact your regional authorized service center(s). Please note that this warranty only applies when the product is purchased in the territory where the service center is located.

NAUTICAM accepts no liability for any damage to and defects in the housing caused by improper use and/or poor maintenance; it is the responsibility of the owner to carefully follow the instructions in our manuals.

NAUTICAM does not hold responsibility for damage, of any nature, to any equipment used with and/or placed within our products.

NAUTICAM accepts no liability for any loss of captured images or the inability to capture images even if it is due to the malfunctioning of our products.

Unauthorized modifications and/or repairs of our products will automatically invalidate the warranty.

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