

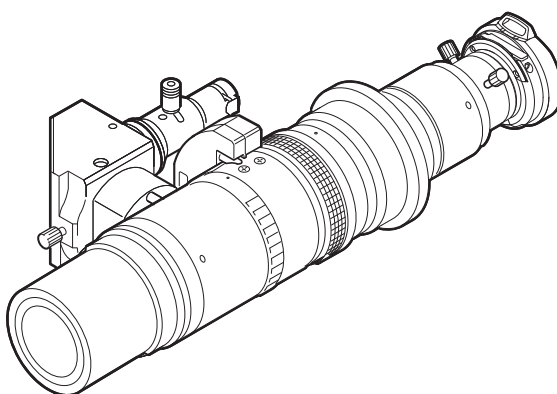


Wide-Range Zoom Lens

VH-Z100T

User's Manual

Read this manual before using the system in order to obtain full performance.
Always keep this manual in a safe place for future reference.



Introduction








This manual describes instructions on basis usage of VH-Z100T wide-range zoom lens, its operation procedures, and precautions. Read this manual before using the system in order to ensure optimum performance.


The VH-Z100T wide-range zoom lens is a dedicated lens for our VHX Series and VH Series of digital microscopes. For further information on the features and performances of each model of digital microscope, refer to the respective manuals. Keep this manual in a safe place for future reference.

■ Symbols

The following symbols alert you to important messages.

Be sure to read these messages carefully.

	It indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	It indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	It indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	It indicates a situation which, if not avoided, could result in product damage as well as property damage.
	It indicates cautions and limitations that must be followed during operation.
	It indicates additional information on proper operation.
	It indicates tips for better understanding or useful information.

 It indicates the reference pages in this manual or the reference pages in separate manuals.


■ General Cautions


- At startup and during operation, be sure to monitor the functions and performance of the VH-Z100T.
- We recommend that you take substantial safety measures to avoid any damage in the event of a problem occurring.
- Do not modify the VH-Z100T, or use it in any way other than described in the specification.
- When the VH-Z100T is used in combination with other instruments, functions and performance may be degraded, depending on the operating conditions and surrounding environment.

Tips on Correct Use


Be sure to follow the precautions below in order to use the VH-Z100T correctly and to prevent malfunctions.

■ Cautions in Use

 WARNING	Directly looking into the light through the optical fiber cable may damage your eyes. Be sure to turn off the light when installing or removing the optic fiber cable.
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 CAUTION	<ul style="list-style-type: none">• The VH-Z100T wide-range zoom lens uses precision optical parts. Do not apply shock or impact to the VH-Z100T. Failure to do so might cause the damage.• Do not allow fluid or dust to enter inside the lens. Otherwise, product failure may result.• Be sure to turn off the light when installing or removing the optic fiber cable. Otherwise, product failure may result.
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■ Cautions regarding installation

 CAUTION	<ul style="list-style-type: none">• The stand must be installed on the level.• Do not install the VH-Z100T in the place listed below or the likes. Otherwise, product failure may result.<ul style="list-style-type: none">• Place where vibration or impact is directly applied.• Place where the product is exposed to excessive noise.• Place where the ambient temperature drops below +5°C or exceeds +40°C.• Place where the ambient humidity drops below 35% RH or exceeds 80% RH (No condensation).• Place where the temperature rapidly changes.• Place where the product is exposed to a direct breeze from an air conditioner.• Place where there are volatile, flammable substances or corrosive gases.• Place where there are dust, salt, ferrous particles or greasy fumes.• Place where water, oil or chemicals may splash onto the product.
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■ Cautions regarding shipping

 CAUTION	Be sure to use the packing materials specified by KEYENCE for transportation.
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Contents

Introduction	2
Tips on Correct Use	3
Contents.....	4
1 Before Use	5
Checking the Package	5
Part Names	5
Recommended specifications	5
2 Installation	6
Installing the Zoom Lens to the Stand.....	6
Installing the Camera Unit to the Zoom Lens.....	10
Installing the Fiber Cable	12
3 Usage.....	14
Adjusting the Zoom Lens	14
Switching the Illumination.....	16
4 Specifications	18
Specifications	18
Outer Dimensions	18

1

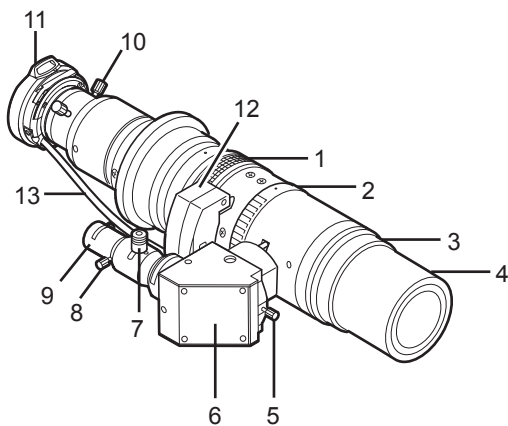
Before Use

Checking the Package

■ VH-Z100T wide-range zoom lens

- Zoom lens 1
- Camera adapter 1
- Lens/Magnification automatic recognition unit 1
- Camera mount (mounted on the product) 1
- User's Manual (this manual) 1

Part Names



- 1 Zoom ring
- 2 Iris diaphragm ring
- 3 Cover ring
- 4 Object lens
- 5 Incident-light illumination fixing screw
- 6 Incident-light illumination unit
- 7 Field diaphragm
- 8 Fiber fixing screw
- 9 Optical fiber cable insertion slot
- 10 Camera mount fixing screw
- 11 Camera mount
- 12 Lens/Magnification automatic recognition unit
- 13 Lens/Magnification automatic recognition unit cable

Recommended specifications





Connection target	Illumination	Recommended parts
VHX-5000	同軸落射照明	Standard fiber comes with the camera cable
	リング照明	OP-87792 Ring illumination unit
VHX-2000 and former VHX series, and VH-5500 series	同軸落射照明	OP-51480 VHX fiber
	リング照明	OP-87792 Ring illumination unit OP-87786 Swing lens fiber
VH series	同軸落射照明	OP-31207 VH fiber
	リング照明	OP-72401 Ring illumination base unit

2

Installation

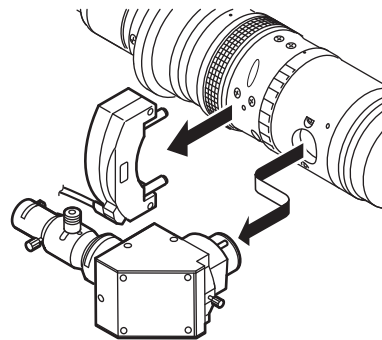
Installing the Zoom Lens to the Stand

The details of the installation may differ for different stands.

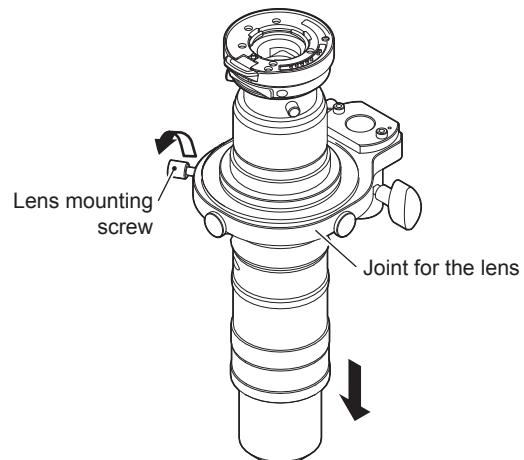
-  Installing the VHX-S550/VHX-S500/VH-S300/VHX-S90F stand with the joint (Page 6)
-  Installing with the VH-S30/VH-S50 free angle observation system (Page 7)
-  Installing with the OP-25539 VH rotating stand (Page 8)
-  Installing with the VH-S5 vibration-proof high-magnification observation system (Page 9)

■ Installing the VHX-S550/VHX-S500/VH-S300/VHX-S90F stand with the joint

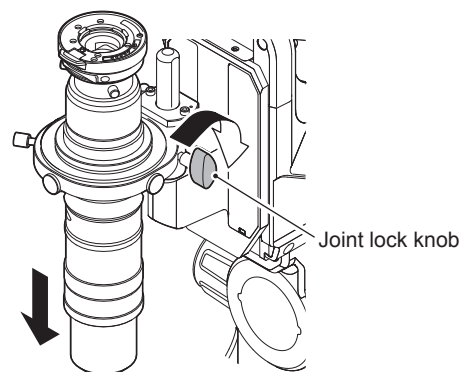
1 Remove the vertical illumination unit from the zoom lens. Next, remove the lens/magnification automatic recognition unit.



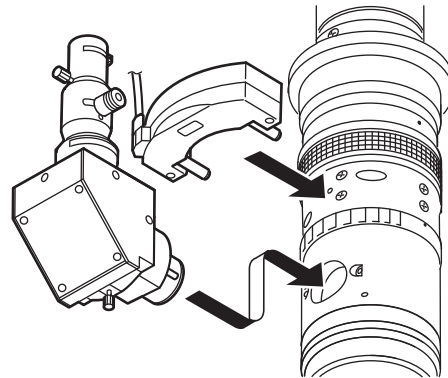
2 Mount the lens in the joint for the lens and secure using the lens mounting screw.



3 Insert the joint for the lens from the top of the joint attachment pole on the Z-axis electric stage and tighten the joint lock knob.

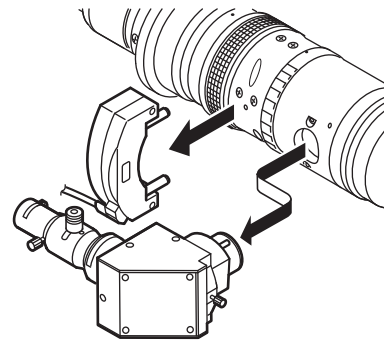


- 4** Attach the lens/magnification automatic recognition unit to the zoom lens. Next, attach the vertical illumination unit.

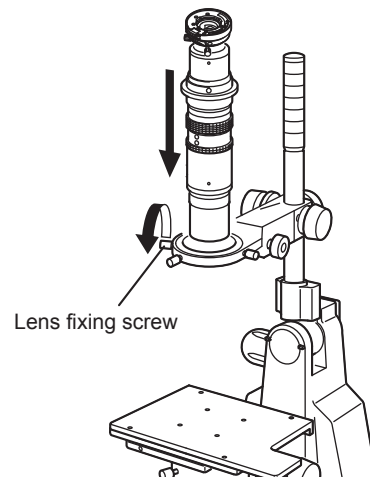


■ **Installing with the VH-S30/VH-S50 free angle observation system**

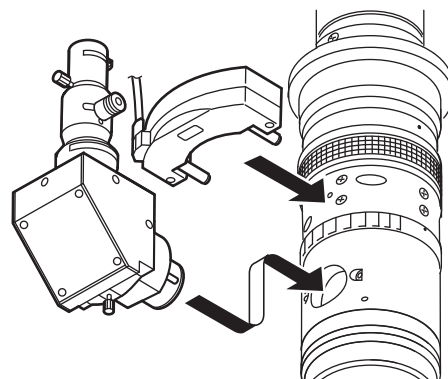
- 1** Remove the coaxial incident light illumination unit from the zoom lens. Next, remove the Lens/Magnification automatic recognition unit.



- 2** Install zoom lens to the Z-axis ultra-fine motion stage and tighten the lens fixing screw.

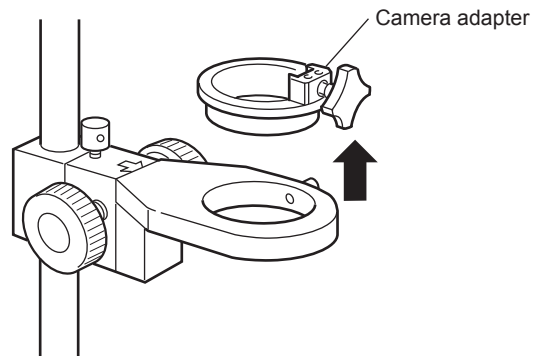


- 3** Install the Lens/Magnification automatic recognition unit to the zoom lens. Next, install the coaxial incident light illumination unit.

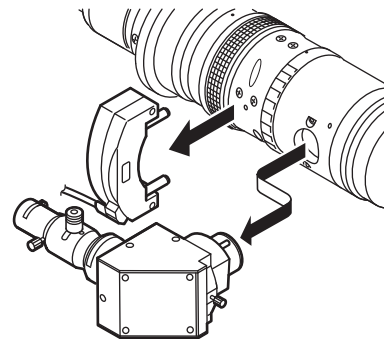


■ Installing with the OP-25539 VH rotating stand

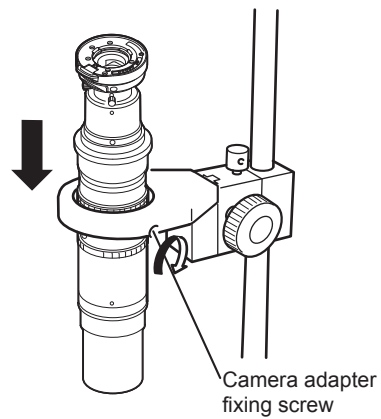
- 1** Loosen the camera mount fixing screw and remove the camera adapter from the stand.



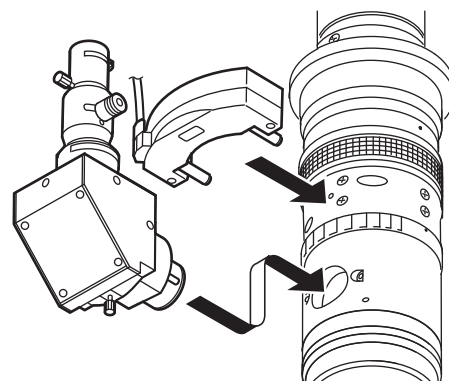
- 2** Remove the coaxial incident light illumination unit from the zoom lens. Next, remove the Lens/Magnification automatic recognition unit.



- 3** Install the zoom lens to the stand and tighten the camera mount fixing screw.



- 4** Install the Lens/Magnification automatic recognition unit to the zoom lens. Next, install the coaxial incident light illumination unit.

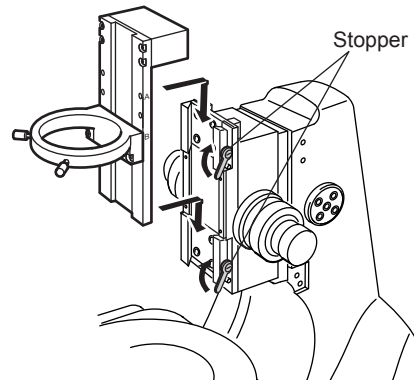


■ Installing with the VH-S5 vibration-proof high-magnification observation system

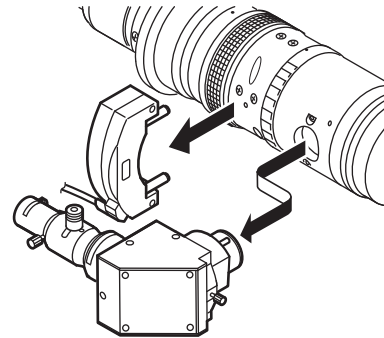
▶ **Important** To mount the VH-Z100T to the VH-S5, the lens holder OP-84277 must be ordered separately.

- 1** Align the lens holder with the groove in the stand and raise the stoppers while pressing firmly. The lens holder is fixed.

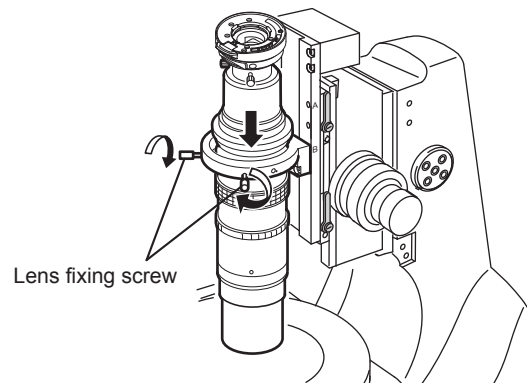
▶ **Important** Install the holder ring of the lens holder in the position B.



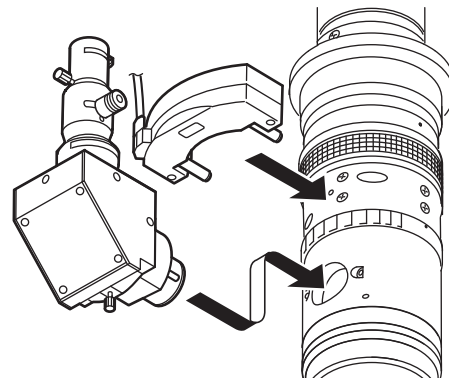
- 2** Remove the coaxial incident light illumination unit from the zoom lens. Next, remove the Lens/Magnification automatic recognition unit.



- 3** Install zoom lens to the holder ring and tighten the lens fixing screw.



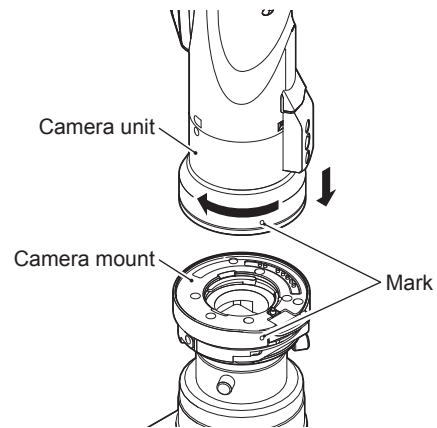
- 4** Install the Lens/Magnification automatic recognition unit to the zoom lens. Next, install the coaxial incident light illumination unit.



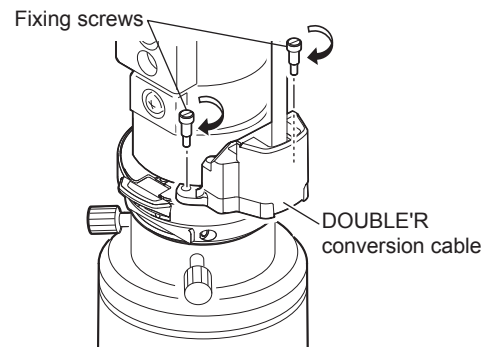
Installing the Camera Unit to the Zoom Lens

■ Installing the VHX series/VH-5500 series camera unit

1 Align the ○ mark on the camera mount with the ○ on the camera unit and press down, then turn in the direction of the arrow until you hear a click to fix the connection.




2 When connecting to the VHX-2000 and the former model with the DOUBLE'R function, install the DOUBLE'R conversion cable (used for the camera) (OP-87802) and connect the connector to the camera unit.

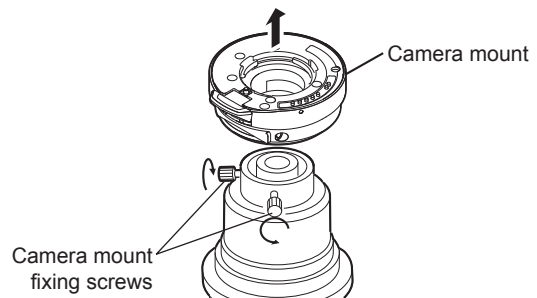


■ Installing the VH series camera unit

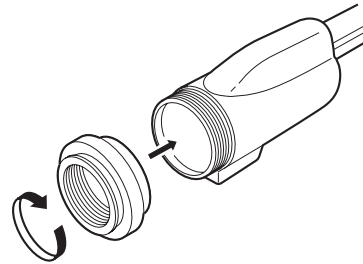
NOTICE

- For information about connecting the VH-5500 Series, refer to  "Installing the VHX series/VH-5500 series camera unit" (Page 10).
- Camera mount is not used when the camera is connected to the VH series.

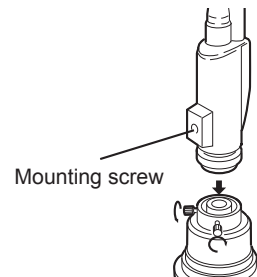
- 1** Loosen the camera mount fixing screws and remove the camera mount from the zoom lens.



- 2** Install the camera adapter to the lens mount of the camera section.



- 3** Install the camera adapter to the zoom lens and tighten the camera mount fixing screws.



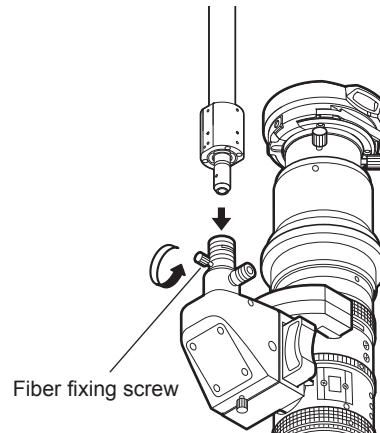
NOTICE

The side with the camera unit mounting screw will be positioned in the lower region of the screen. Determine the direction of the camera unit according to the direction of the mounting screw.

Installing the Fiber Cable

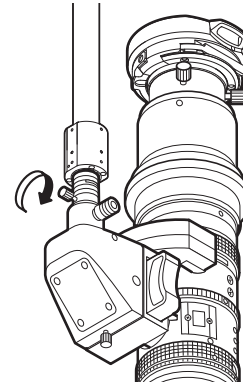
Important Different fiber cables are required when using different units. Refer to  "Recommended specifications" (Page 5) for the details.

- 1** Loosen the fiber fixing screw and insert the fiber cable.



Reference Transmitted lighting can be used at the VHX-S550, VHX-S90BE and VH-S5 mounts. Refer to the user's manual of each stand for details of the connection.

- 2** Insert the fiber cable deep into the unit, then tighten the fiber fixing screw.



Reference Refer to the ring illumination unit instruction manual for details of the installation procedures when using the ring illumination.

MEMO

Adjusting the Zoom Lens

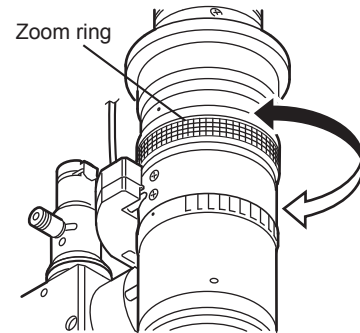
Adjusting the magnification

The magnification can be changed by rotating the zoom ring of the zoom lens.

You can arbitrary change the lens magnification in the range of 100 to 1000 times.

Reference

- It is recommended that the magnification should be adjusted first in lower values. Because the lower the magnification is, the easier it is to come in focus and wider the sight is, enabling the operator to find the object easily.
- If observed at low magnification, images shown at the edges of the screen may be partly lost or lighting may be uneven. However, this is not abnormal.



Adjusting the focus

Focus can be adjusted by moving the Z-axis stage up and down.

Refer to the user's manual that came with the stand that you are using for information on operating the Z-axis stage.

Reference

- The observation distance is about 25mm.
- It is recommended to use Z-axis stage equipped with the vernier dial.

Adjusting the iris diaphragm

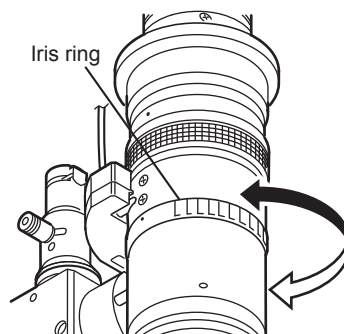
The iris diaphragm can be adjusted by rotating the iris diaphragm ring to the optimal position for observation.

Toward OPEN : The resolution improves and the image brightens.

Normally, set it around OPEN.

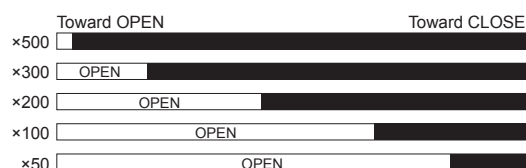
Toward CLOSE : Use this position when you want to obtain deeper field of depth.

However, setting it too close to CLOSE, the quality decreases.



NOTICE

If you reduce the magnification of the lens, iris diaphragm remains OPEN for a while even if you rotate the iris diaphragm ring toward CLOSE.

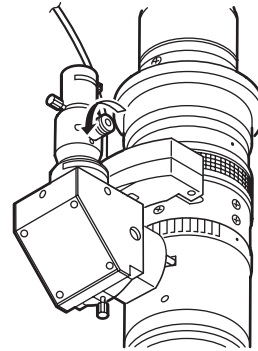


■ Adjusting the field diaphragm

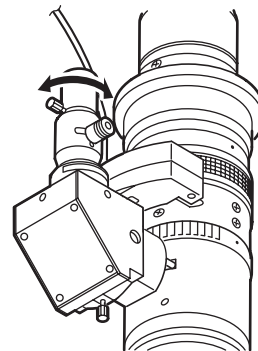
You can emphasize the outline of the target by adjusting the field diaphragm.

Normally, you can adjust it by turning the lighting volume knob around the "NORMAL" indication to obtain the optimal view. If it is adjusted close to the "EDGE" indication, the outline of the object is emphasized, while the sight becomes dark and resolution decreases.

- 1** Turn the field diaphragm knob in the direction of the arrow to loosen it.



- 2** Move field diaphragm knob to the left or right to adjust the field diaphragm. Tighten the field diaphragm knob once it is in the optimal position.



Switching the Illumination

The illumination can be switched through a one button operation.
The following illuminations and operations can be used at VH-Z100T.



Important

This function can be used only on the VHX Series.

The operation method varies depending on the VHX Series model.

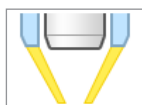
Available illuminations

Available illuminations and the illuminations switching order are shown as follows.
Switch the type of illumination by pressing the button on the console or on the software.

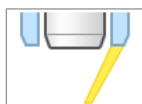
Controller	Ring illumination unit	Available illuminations			
		1	2	3	4
VHX-5000	Not attached	同軸落射	同軸片射	同軸側射	—
	Attached	同軸落射	同軸片射	リング照明	ミックス照明*
VHX-2000 and former	Not attached	同軸落射	同軸片射	同軸側射	—
	Attached	同軸落射	リング片射	リング照明	—

* ミックス照明 is only used for when the OP-87792 is installed.

Reference



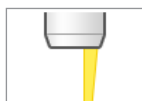
リング照明 Observation in dark field is possible.



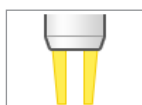
リング片射 Observation in dark field with height differences such as scratches being emphasized is possible.



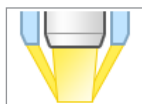
同軸落射 Observation in bright field is possible.



同軸片射 Observation in bright field with height differences such as scratches being emphasized is possible.



同軸側射 Observation in bright field with the brightness of center part being reduced is possible.



ミックス照明 Mixing condition of リング照明 and 同軸落射 can be adjusted.

Recommended Specifications

Connection target	Illumination	Recommended parts
VHX-5000	リング照明	OP-87792 Ring illumination unit
VHX-2000 and former VHX series, and VH-5500 series	リング照明	OP-87792 Ring illumination unit OP-87786 Swing lens fiber
VH series	リング照明	OP-72401 Ring illumination base unit

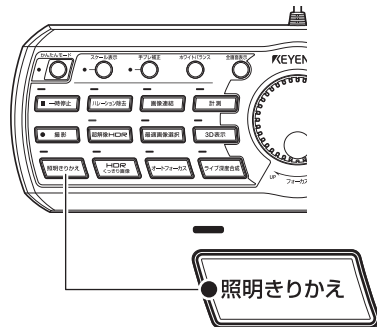
Ring illumination base unit OP-72400 and triple light base unit OP-87270 can also be connected, but some functions are limited when using VHX-5000.

■ Operation

Press the switch button on the console or on the software.
Specific operation method by each model are as follows.

● VHX-5000

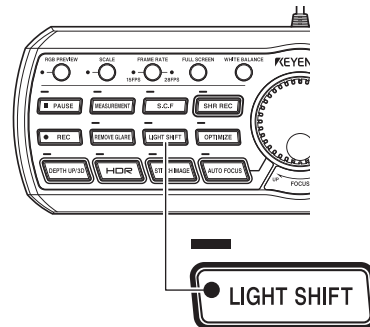
Press the **照明きりかえ** button on the console.
The LED on the Light Shift button lights.



Reference Light shift operations can be also performed from the [照明] tab of [明るさ・照明] in the VHX MENU.

● VHX-2000/1000

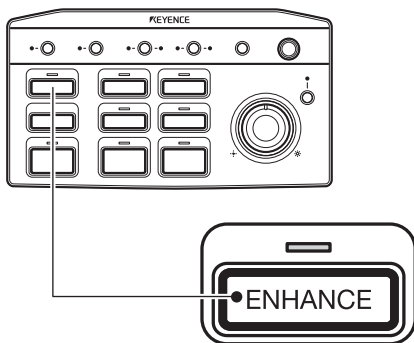
Press the Light Shift button on the console.
The LED on the Light Shift button lights.



Reference Light shift operations can be also performed from the [Functions] tab of [Image Enhancement] in the VHX menu.

● VHX-500/600/500F/900

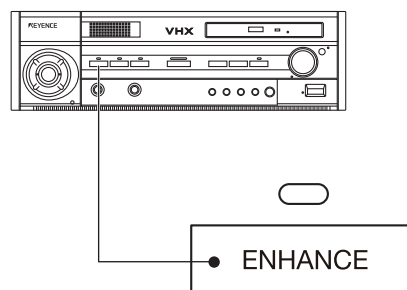
Press the ENHANCE button on the console.
The LED on the ENHANCE button lights.



Reference This operation can also be performed by selecting [Bump enhancement mode] from the [Camera/Image] command on the menu bar.

● VHX-100/100F/200

Press the ENHANCE button on the front panel of the unit.
The LED on the ENHANCE button lights.



Reference This operation can also be performed by selecting [Bump enhancement mode] from the [Camera/Image] command on the menu bar.

4

Specifications

Specifications

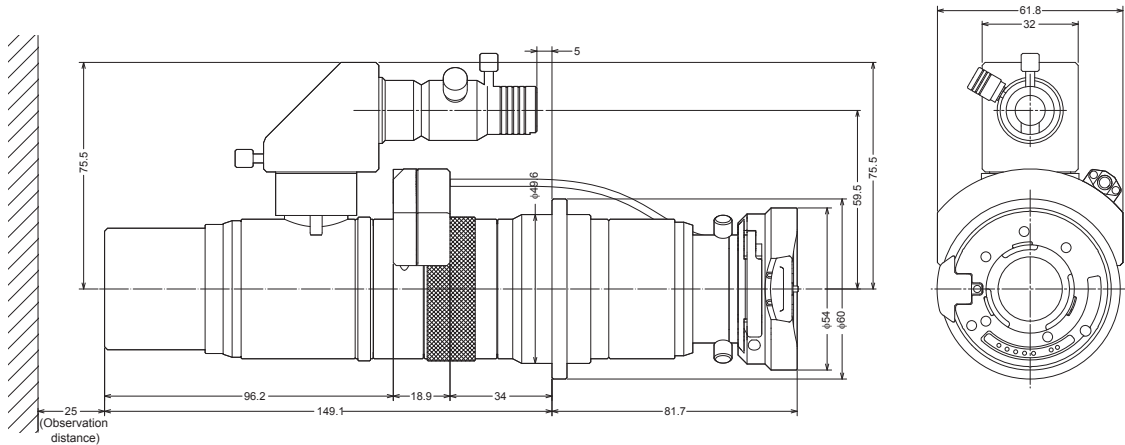
Items		Specifications					
Model		VH-Z100T					
Magnification ^{*1}		100	200	300	500	700	1000
Observation range (mm)	H (horizontal)	3.05	1.53	1.02	0.61	0.44	0.30
	V (vertical)	2.28	1.14	0.76	0.46	0.33	0.23
	Diagonal	3.81	1.90	1.27	0.76	0.54	0.38
Observation distance (mm)		25 (20 ^{*2})					
Illumination system		Coaxial incident-light illumination/Diffuse illumination ^{*2} / Simple transmitting illumination ^{*3}					
Weight		Approx. 1kg					

*1 Magnification when displayed on the 1/2 inch camera, 15-inch monitor.

*2 When ring illumination adapter is mounted.

*3 The simple transmitting illumination is built in the VHX-S550/VHX-S90BE/VH-S5.

Outer Dimensions



WARRANTIES AND DISCLAIMERS

- (1) KEYENCE warrants the Products to be free of defects in materials and workmanship for a period of one (1) year from the date of shipment. If any models or samples were shown to Buyer, such models or samples were used merely to illustrate the general type and quality of the Products and not to represent that the Products would necessarily conform to said models or samples. Any Products found to be defective must be shipped to KEYENCE with all shipping costs paid by Buyer or offered to KEYENCE for inspection and examination. Upon examination by KEYENCE, KEYENCE, at its sole option, will refund the purchase price of, or repair or replace at no charge any Products found to be defective. This warranty does not apply to any defects resulting from any action of Buyer, including but not limited to improper installation, improper interfacing, improper repair, unauthorized modification, misapplication and mishandling, such as exposure to excessive current, heat, coldness, moisture, vibration or outdoors air. Components which wear are not warranted.
- (2) KEYENCE is pleased to offer suggestions on the use of its various Products. They are only suggestions, and it is Buyer's responsibility to ascertain the fitness of the Products for Buyer's intended use. KEYENCE will not be responsible for any damages that may result from the use of the Products.
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