

MZ video zoom stereo microscope

INSTRUCTIONS



Honorable consumers: Thank you for choosing to buy our product. Please read this instruction carefully before you use in order to use and maintain this product better.

1 Before use

1-1 NOTICE

- 1) Microscope ought to be placed in a dry and clean place. Do not expose the microscope in the sun directly. Avoid high temperature and violent vibration.
- 2) As microscope is a precision instrument, handle with care, avoiding impact or abrupt movement during transportation.
- 3) To keep the image clear, do not leave fingerprints or stains on the surfaces of the lens.
- 4) Never turn the left and right focusing knob in the adverse direction at the same time; otherwise the microscope will be damaged.
- 5) Hold the camera with one hand for fearing of falling when you take the films out of the big camera.

1-2 MAINTENANCE

- 1) All lenses must be kept clean. Fine dust on surface of the lens should be blown off with hand blower or wiped off gently with a soft lens tissue; Fingerprints or oil marked on it should be wiped off with a tissue moistened with a small amount of xylene or a 3:7 mixture of alcohol and ether.
- 2) Never use the organic solution to clean the other surface (especially the plastic surfaces). If necessary, please choose the neutral detergent.
- 3) Do not take the microscope apart for fearing that it is damaged.
- 4) After using, be sure to cover the microscope with the dust-cover provided and store it in a dry and clean place free from moisture to prevent rust.

2 Optical data

Zoom body

By the use of 4 elements mechanical compensation structure, the quality of image is ensured to the maximum extent. Zoom mode including: Manual Zoom, Manual Zoom with Detents, When the measure is used, the magnification calibration is needed. the multiple are located at 0.68X, 1X, 2X, 3X, 4X, 4.5X.

Zoom Range	0.68X~4.5X
Zoom Ratio	6.6
The maximum FOV angle of the objective	$2\omega=19.5^\circ$
The FOV angle of the image side	$2\omega=7.6^\circ$

Objective Lens

Semi-Plan Achromatic Objective, Can be mount the Infinity Corrected Objective Lens or Biological Microscope objective. A Zooming Objective Lens is configured according to the user's need (change of the working distance and magnification)



Objective Lens	0.3X	0.5X	0.75X	1.0X	1.5X	2.0X
Focus Distance	333mm	200mm	133mm	100mm	67mm	50mm
Working Distance	331mm	198mm	131mm	96mm	63mm	46mm
The FOV angle of the objective 2ω	19.5°	19.5°	19.5°	19.5°	19.5°	19.5°

CCD Couplers

Designed for 1/3" CCD Camera, in which 1.0X、1.5X、2.0X three magnification adopt the "far-take" optics structure, cut the length of system largely.

Coupler	0.38X	0.5X	0.75X	1.0X	1.5X	2.0X
Focus Distance	67mm	90mm	135mm	180mm	270mm	360mm
Optical Length (Approx.)	76mm	97mm	103mm	130mm	189mm	252mm
The FOV angle of the objective 2ω	7.6°	7.6°	7.6°	7.6°	7.6°	7.6°
The FOV diameter of the image side \geq	6.1 mm	6.1 mm	6.1 mm	6.1 mm	6.1 mm	6.1 mm

Optical Specification Chart

Based on 14" Monitor & 1/3" CCD Camera

Coupler	0.38x		0.5x		0.75x		1.0x		1.5x		2.0x		
Auxiliary Lens	Mag.	FOV mm	Mag.	FOV mm	Mag.	FOV mm	Mag.	FOV mm	Mag.	FOV mm	Mag.	FOV mm	Working Distance mm
0.3x	4.65x-31x	77-12	6x-41x	59-9	9x-61x	39-6	12x-81x	29-4	18x-121x	19.6-3	24x-162x	14.7-2	331
0.5x	7.8x-51x	46-7	10x-68x	35-5	15x-101x	23.5-4	20x-135x	17.6-3	31x-203x	11.8-2	41x-270x	8.8-1.3	198
0.75x	11.6x-77x	31-4.7	15x-101x	23.5-3.6	23x-152x	15.7-2.4	30.6x-202x	12-1.8	46x-304x	7.8-1.2	61x-405x	6-0.9	131
1.0x	15.5x-102x	23-3	20x-135x	17.6-2.7	30.6x-202x	12-1.8	41x-270x	9-1	61x-405x	6-0.9	81.6x-540x	4-0.7	96
1.5x	23x-154x	15-2.3	31x-203x	11.8-1.8	46x-304x	7.8-1.2	61x-405x	6-0.9	92x-607x	4-0.6	122x-810x	3-0.4	63
2.0x	31x-205x	11.6-1.7	41x-270x	8.8-1.3	61x-405x	6-0.9	81.6x-540x	4-0.7	122x-810x	3-0.4	163x-1080x	2-0.3	46

3 Operation

1. Take out zoom body and CCD coupler, and then screw the CCD coupler onto the zoom body. Diaphragm iris can be screwed between CCD coupler and zoom body.
2. Take out CCD interface and screw it on to the coupler, then fasten the 4 screw bolts on the upper part of the eyepiece with wrench to fix the CCD interface.
3. Take out the objective lens and screw it on the lower part of the zoom body. Coaxial illuminator can be screwed between the zoom body and objective lens. The user can select eyepieces or objective lens in different detents to connect with the zoom body as required.
4. Plug one end of the BNC video cable to the hole on the CCD tube marked with Video, and the other end to the display. Plug one end of power cable to the hole on the CCD marked with DC-in and the other end to the power supply.
5. Put monocular microscope on the bracket of the E-arm and fasten the knob at the interface between the zoom body and the E-arm bracket to fix the microscope.
6. Adjust the height of the microscope to the proper operation distance based on "the Optical Specification Chart"
7. Adjust the microscope to a position vertical with the pedestal: put a cross scaling plate into the microscope and a

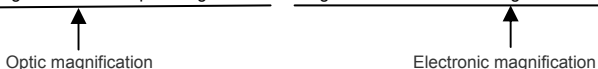
scaling plate on the carrier of the stand pedestal to make lens to the high zoom ratio. Adjust the hand wheel till the image becomes clear, move the platform to make superposition of the 2 crosses, and then adjust the lens to low zoom ratio. Superposition of the 2 crosses means that the lens is vertical with the pedestal, otherwise, not vertical. Repeat above operation to adjust the screw bolts between lens and the stand.

8. Put the objective to be observed onto the carrier, adjust the objective lens to low or middle zoom ratio, rotate the zoom hand wheel till image appears on the display, and then adjust the objective lens to high zoom ratio gradually. Each time, the zoom hand wheel should be rotated to make the image clear and then adjust the objective lens to high zoom ratio gradually. If the image becomes blurring, adjust CCD interface till to make it clear and then to the high ratio. If the image becomes blurring again, adjust the zoom hand wheel again repeatedly. No matter at high or low ratio, the display image must be kept clear.

Size of CCD pickup device	width (mm)	highness (mm)	diagonal (mm)
1	12.7	9.6	16
2/3	8.8	6.6	11
1/2	6.4	4.8	8
1/3	4.8	3.6	6
1/4	3.2	2.4	4

Total magnification=Optic magnification x Electronic magnification: :

Objective magnification x Coupler magnification x Diagonal size of monitor/Diagonal size of CCD pickup device



For example: suppose that the zoom range of a zoom body is 0.68—4.5, coupler magnification is 0.3, objective magnification is 0.3, using 1/3" CCD camera and 14" monitor, then the method to calculate the total magnification is:
 Min magnification: $0.68 \times 0.3 \times 0.3 \times (14 \times 24.5/6)=4$

Max magnification: $4.5 \times 0.3 \times 0.3 \times (14 \times 24.5/6)=23$

Field of view(FOV)=Diagonal size of CCD pickup device/(Objective magnification x Coupler magnification x zoom body magnification)

The method to calculate the FOV in the above example is:

Max FOV: $6/(0.3 \times 0.3 \times 0.68)=98$

Min FOV: $6/(0.3 \times 0.3 \times 4.5)=15$