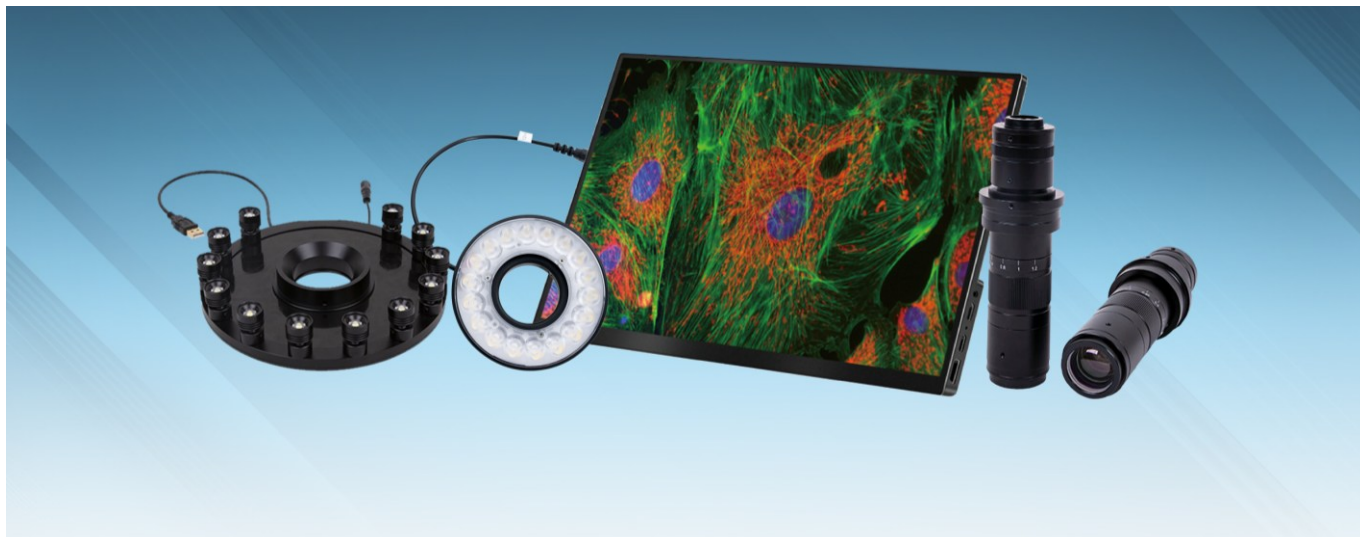


ToupTek Intelligent Imaging Accessories Catalog



27. 10, 2025

Product Catalog

ToupTek Intelligent Imaging Accessories Catalog	1
Product Catalog	I
1 ToupCam® Camera & Microscope Configuration	4
1.1 Trinocular Digital Microscope (1/2)	4
1.2 Trinocular Digital Microscope (2/2)	4
1.3 Binocular Digital Microscope	5
1.4 Size Description of the Connection Parts	6
2 Introduction and Features of ToupCam Multi-Interface Camera	7
3 1080P/4K Displays	8
3.1 TPHD4K133D HDMI OLED Displayer	8
3.1.1 TPHD4K133D ' s Basic Characteristic	8
3.1.2 TPHD4K133D ' s Datasheet(1)	9
3.1.3 TPHD4K133D and XCAM Series HDMI Camera	10
3.2 TPHD1080PD HDMI Displayer	13
3.2.1 TPHD1080PD ' s Basic Characteristic	13
3.2.2 TPHD1080PD Datasheet(1)	14
3.2.3 TPHD1080PD and XCAM Series HDMI Camera	15
3.3 TPHD1080P156A HDMI Displayer	18
3.3.1 TPHD1080P156A ' s Basic Characteristic	18
3.3.2 TPHD1080P156A Datasheet	19
3.3.3 TPHD1080P156A and HDMI Camera	20
4 1080P/4K Touchscreen Displays	23
4.1 TP2HD4K133D Touchscreen HDMI OLED Display	23
4.1.1 TP2HD4K133D Basic Features	23
4.1.2 TP2HD4K133D ' s Datasheet(1)	24
4.1.3 TP2HD4K133D and XCAM Series HDMI Camera	24
4.2 TP2HD4K133B Touchscreen HDMI LCD Displayer	28
4.2.1 TP2HD4K133B ' s Basic Characteristic	28
4.2.2 TP2HD4K133B Datasheet(1)	29
4.2.3 TP2HD4K133B and XCAM Series HDMI Camera	30
4.3 TP2HD1080PD HDMI Displayer	33
4.3.1 TP2HD1080PD ' s Basic Characteristic	33
4.3.2 TP2HD1080PD Datasheet(2)	34
4.3.3 TP2HD1080PD and XCAM Series HDMI Camera	35
5 Light Source Series	38
5.1 Introduction of DRL-10040/DRL-10065 Series Direct Ring Light	38
5.1.1 DRL-10040/DRL-10065 Series Direct Ring Light General Characteristics	38
5.1.2 DRL-10040/DRL-10065 Series Direct Ring Light Illuminance Analysis	39
5.1.3 DRL-10040/DRL-10065 Series Direct Ring Light Optional Models	39
5.1.4 Installation of DRL-10040/DRL-10065 Series Ring Light	39
5.1.5 DRL-10040/DRL-10065 Series Direct Ring Light Packing List	40
5.1.6 Pictures Taken with DRL-10040/DRL-10065 Series Direct Ring Light	41
5.2 Angle Adjustable LED Ring Light AALRL-200-7650	42
5.3 The Light Source for TZM0756 MZO	44
5.3.1 TZM0756 Series Light Source	44
5.3.2 TZM0756 Series Light Source Packing Information	45
5.4 The Light Source for TZM0745B MZO	47
5.4.1 TZM0745B Series Light Source Module	47
5.4.2 The Packing Information of Light Source for TZM0745B MZO	47
6 Continuous Zoom Objectives	48
6.1 TZM0756 MZO	48
6.1.1 The Configuration of TZM0756 MZO with Five Modules	48

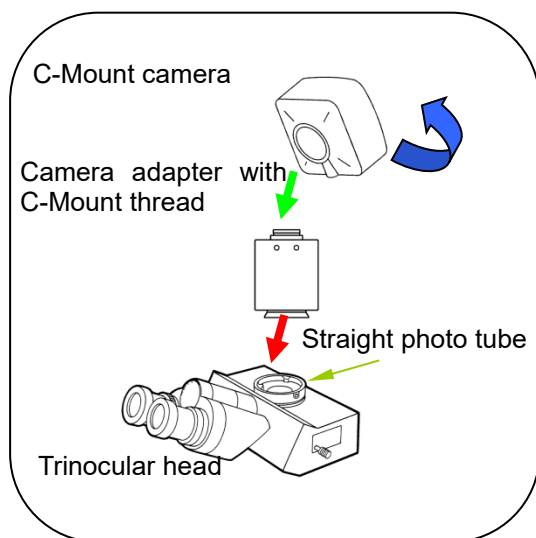
6.1.2	<i>TZM0756 MZO ' s Middle Zoom Module</i>	49
6.1.3	<i>TZM0756 MZO ' s Auxiliary Lens</i>	49
6.1.4	<i>TZM0756 MZO ' s TV Lens</i>	49
6.1.5	<i>TZM0756 MZO ' s Bracket Adapter</i>	50
6.1.6	<i>TZM0756 MZO ' s Optional Module</i>	50
6.1.7	<i>The Optical Specifications of TZM0756 MZO with Different Auxiliary &TV Lens</i>	50
6.1.8	<i>The Dimension of TZM0756 MZO with Different Light Module</i>	51
6.1.9	<i>How to Configure TZM0756 MZO</i>	51
6.1.10	<i>TZM0756 MZO ' s Packing List</i>	52
6.1.11	<i>Order List of TZM0756 MZO</i>	52
6.2	<i>TZM0745A MZO</i>	55
6.2.1	<i>The Configuration of TZM0745A MZO with Five Modules</i>	55
6.2.2	<i>TZM0745A MZO ' s Middle Zoom Module</i>	56
6.2.3	<i>TZM0745A MZO ' s Auxiliary Lens</i>	56
6.2.4	<i>TZM0745A MZO ' s TV Lens</i>	57
6.2.5	<i>TZM0745A MZO ' s Bracket Adapter</i>	57
6.2.6	<i>TZM0745A MZO ' s The Optional Module</i>	57
6.2.7	<i>The Optical Specifications of TZM0745A MZO with Different Auxiliary &TV Lens</i>	58
6.2.8	<i>The Dimension of TZM0745A MZO with Different Light Module</i>	58
6.2.9	<i>How to Configure TZM0745A MZO</i>	59
6.2.10	<i>TZM0745A MZO Packing List</i>	60
6.2.11	<i>Order List of TZM0745A MZO</i>	60
6.3	<i>TZM0745B MZO</i>	62
6.3.1	<i>The Configuration of TZM0745B MZO with Five Modules</i>	62
6.3.2	<i>TZM0745B MZO ' s Middle Zoom Module with Preconfigured Auxiliary Lens, TV Lens</i>	62
6.3.3	<i>TZM0745B MZO ' s Auxiliary Lens</i>	63
6.3.4	<i>TZM0745B MZO ' s TV Lens</i>	63
6.3.5	<i>TZM0745B MZO ' s Bracket Adapter Module</i>	63
6.3.6	<i>TZM0745B MZO ' s Optional Module</i>	64
6.3.7	<i>The Optical Specifications of TZM0745B MZO with Different Auxiliary &TV Lens</i>	64
6.3.8	<i>The Dimension of TZM0745B MZO with Auxiliary Lens and TV Lens Configuration</i>	64
6.3.9	<i>TZM0745B MZO Packing List</i>	65
6.3.10	<i>Order List of TZM0745B MZO</i>	65
6.4	<i>TZM0480 MZO</i>	66
6.4.1	<i>The Configuration of TZM0480 MZO with Five Modules</i>	66
6.4.2	<i>TZM0480 MZO ' s Middle Zoom Module</i>	67
6.4.3	<i>TZM0480 MZO ' s Auxiliary Lens</i>	67
6.4.4	<i>TZM0480 MZO ' s TV Lens</i>	67
6.4.5	<i>TZM0480 MZO ' s Bracket Adapter</i>	67
6.4.6	<i>TZM0480 MZO ' s Optional Module</i>	68
6.4.7	<i>The Optical Specifications of TZM0480 MZO with Different Auxiliary &TV Lens</i>	68
6.4.8	<i>The Dimension of TZM0480 MZO with Different Light Module</i>	68
6.4.9	<i>How to Configure TZM0480 MZO</i>	69
6.4.10	<i>TZM0480 MZO ' s Packing List</i>	69
6.4.11	<i>Order List of TZM0480 MZO</i>	70
6.5	<i>TZM0460 MZO</i>	72
6.5.1	<i>The Configuration of TZM0460 MZO with Five Modules</i>	72
6.5.2	<i>TZM0460 MZO ' s Middle Zoom Module</i>	73
6.5.3	<i>TZM0460 MZO ' s Auxiliary Lens</i>	73
6.5.4	<i>TZM0460 MZO ' s TV Lens</i>	73
6.5.5	<i>TZM0460 MZO ' s Bracket Adapter</i>	73
6.5.6	<i>TZM0460 MZO ' s Optional Module</i>	74
6.5.7	<i>The Optical Specifications of TZM0460 MZO with Different Auxiliary &TV Lens</i>	74
6.5.8	<i>The Dimension of TZM0460 MZO with Different Light Module</i>	74
6.5.9	<i>How to Configure TZM0460 MZO</i>	75
6.5.10	<i>TZM0460 MZO ' s Packing List</i>	75
6.5.11	<i>Order List of TZM0460 MZO</i>	76
6.6	<i>TZM0440 MZO</i>	78
6.6.1	<i>The Configuration of TZM0440 MZO with Five Modules</i>	78

6.6.2	<i>TZM0440 MZO ' s Middle Zoom Module</i>	79
6.6.3	<i>TZM0440 MZO ' s Auxiliary Lens</i>	79
6.6.4	<i>TZM0440 MZO ' s TV Lens</i>	79
6.6.5	<i>TZM0440 MZO ' s Bracket Adapter</i>	79
6.6.6	<i>TZM0440 MZO ' s Optional Module</i>	80
6.6.7	<i>The Optical Specifications of TZM0440 MZO with Different Auxiliary &TV Lens</i>	80
6.6.8	<i>The Dimension of TZM0440 MZO with Different Light Module</i>	80
6.6.9	<i>How to Configure TZM0440 MZO</i>	81
6.6.10	<i>TZM0440 MZO ' s Packing List</i>	81
6.6.11	<i>Order List of TZM0440 MZO</i>	82
6.7	TZM0660 MZO	84
6.7.1	<i>The Configuration of TZM0660 MZO with Five Modules</i>	84
6.7.2	<i>TZM0660 MZO ' s Middle Zoom Module</i>	85
6.7.3	<i>TZM0660 MZO ' s Auxiliary Lens</i>	85
6.7.4	<i>TZM0660 MZO ' s TV Lens</i>	85
6.7.5	<i>TZM0660 MZO ' s Bracket Adapter</i>	85
6.7.6	<i>TZM0660 MZO ' s Optional Module</i>	86
6.7.7	<i>The Optical Specifications of TZM0660 MZO with Different Auxiliary &TV Lens</i>	86
6.7.8	<i>The Dimension of TZM0660 MZO with Different Light Module</i>	86
6.7.9	<i>How to Configure TZM0660 MZO</i>	87
6.7.10	<i>TZM0660 MZO ' s Packing List</i>	87
6.7.11	<i>Order List of TZM0660 MZO</i>	88
6.8	TZM0640 MZO	90
6.8.1	<i>The Configuration of TZM0640 MZO with Five Modules</i>	90
6.8.2	<i>TZM0640 MZO ' s Middle Zoom Module</i>	91
6.8.3	<i>TZM0640 MZO ' s Auxiliary Lens</i>	91
6.8.4	<i>TZM0640 MZO ' s TV Lens</i>	91
6.8.5	<i>TZM0640 MZO ' s Bracket Adapter</i>	91
6.8.6	<i>TZM0640 MZO ' s Optional Module</i>	92
6.8.7	<i>The Optical Specifications of TZM0640 MZO with Different Auxiliary &TV Lens</i>	92
6.8.8	<i>The Dimension of TZM0640 MZO with Different Light Module</i>	92
6.8.9	<i>How to Configure TZM0640 MZO</i>	93
6.8.10	<i>TZM0640 MZO ' s Packing List</i>	93
6.8.11	<i>Order List of TZM0640 MZO</i>	94
6.9	TZM0880 MZO	96
6.9.1	<i>The Configuration of TZM0880 MZO with Five Modules</i>	96
6.9.2	<i>TZM0880 MZO ' s Middle Zoom Module</i>	97
6.9.3	<i>TZM0880 MZO ' s Auxiliary Lens</i>	97
6.9.4	<i>TZM0880 MZO ' s TV Lens</i>	97
6.9.5	<i>TZM0880 MZO ' s Bracket Adapter</i>	97
6.9.6	<i>TZM0880 MZO ' s Optional Module</i>	98
6.9.7	<i>The Optical Specifications of TZM0880 MZO with Different Auxiliary &TV Lens</i>	98
6.9.8	<i>The Dimension of TZM0880 MZO with Different Light Module</i>	98
6.9.9	<i>How to Configure TZM0880 MZO</i>	99
6.9.10	<i>TZM0880 MZO ' s Packing List</i>	99
6.9.11	<i>Order List of TZM0880 MZO</i>	100
7	Microscope Stands	102
7.1	Stand for MZO / AFDM	102
7.1.1	<i>Bracket for Stand</i>	102
7.1.2	<i>Base for Stand</i>	103
7.1.3	<i>Microscope Stand</i>	103
7.2	TPS-600 Series Stand with Different Bracket	108
8	ToupTek®-- Contact Information	112
9	ToupTek Web	112
9.1	Microscopic Web	112
9.2	Astronomy Web	112
9.3	Astronomy independent station/shop	112

1 ToupCam® Camera & Microscope Configuration

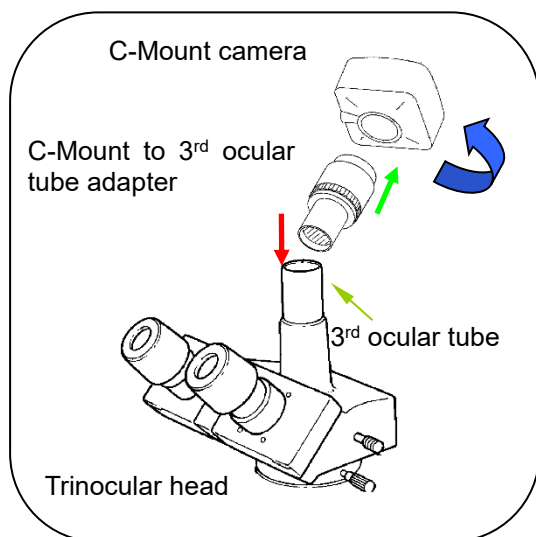
1.1 Trinocular Digital Microscope (1/2)

Attach the C-mount camera and Adapter to the straight photo tube



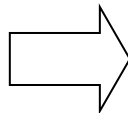
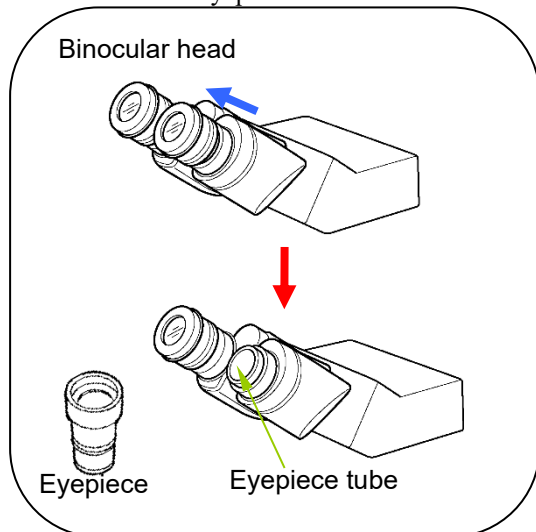
1.2 Trinocular Digital Microscope (2/2)

Attach the C-Mount camera and adapter to the 3rd ocular tube or the other 2 eyepiece tubes

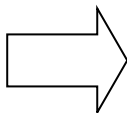
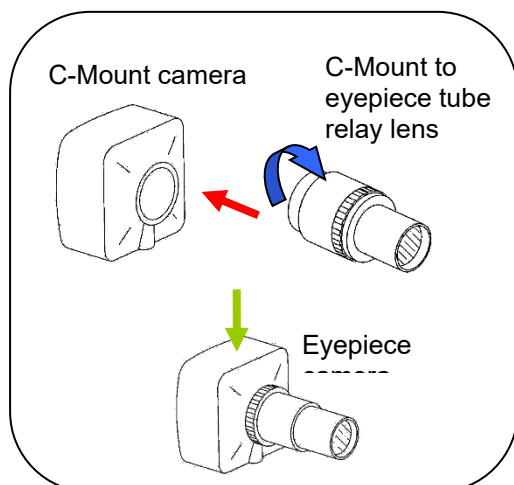


1.3 Binocular Digital Microscope

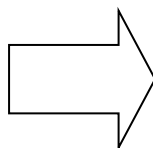
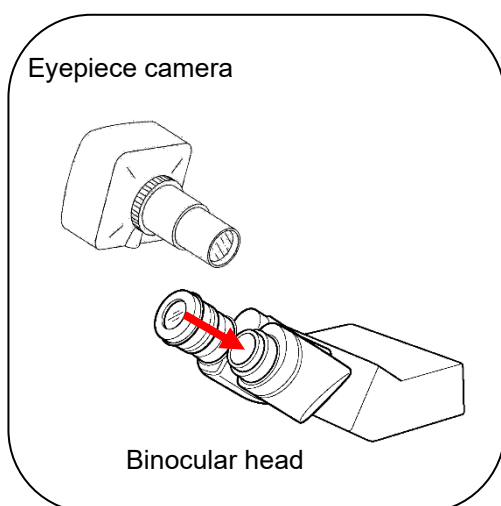
STEP 1: Remove the eyepiece from the ocular tube or the eyepiece tube



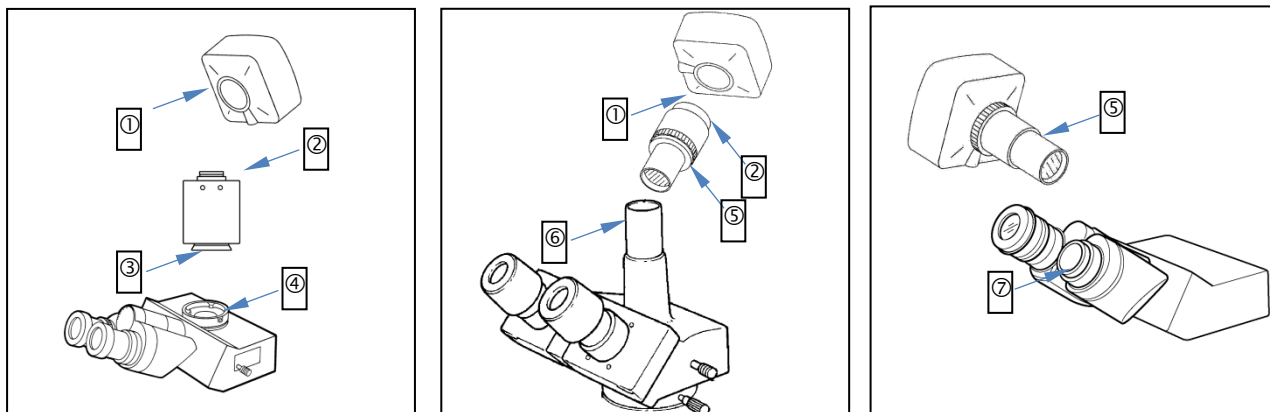
STEP 2: Attach (Screw) the camera Adapter to the C-mount camera



STEP 3: Attach (Insert) the eyepiece camera into the ocular tube or eyepiece tube



1.4 Size Description of the Connection Parts



- ① Standard C-Mount: Dia.1 inch (25.4mm) female thread
- ② Standard C-Mount: Dia.1 inch (25.4mm) male thread
- ③ Camera Adapter connector: size varies between microscope brands
- ④ Straight photo tube: size varies between microscope brands
- ⑤ Relay lens: standard eyepiece connector size, Dia.23.2mm (male)
- ⑥ 3rd ocular tube: standard eyepiece connector size, Dia.23.2mm (female)
- ⑦ Ocular tube: standard eyepiece connector size, Dia.23.2mm (female)

2 Introduction and Features of ToupCam Multi-Interface Camera

ToupTek Photonics' [Intelligent Imaging](#) Accessories Series targets typical scenarios such as microscopic imaging, industrial inspection, and scientific research and teaching. It builds a modular ecosystem consisting of "display terminal + lighting module + continuous zoom monocular objective (MZO) + connection/adaptation accessories," creating an efficient, intuitive, and expandable digital imaging workstation for users.

This accessory system covers the complete chain from observation, framing, and display to lighting and mechanical installation. It can be used for both new imaging systems and digital upgrades of traditional microscopy equipment.

The display terminals in this series offer multiple resolutions and sizes in 4K and 1080P, covering both AM-OLED and IPS LCD technologies, with touch and non-touch versions available.

Combined with an adjustable angle folding bracket and standard HDMI interface, it is convenient for close-range operation on lab benches and suitable for long-distance demonstrations in production lines and training scenarios.

The screen's high contrast, wide color gamut, and 178° wide viewing angle accurately reproduce sample details and color gradations when paired with high-definition camera links, meeting diverse needs in inspection, recording, and teaching.

The lighting system includes various solutions such as ring lights, polarized ring lights, coaxial lights, and transmitted bottom lights, allowing precise illumination for highly reflective, diffusely reflective, texturally complex, or transparent samples.

The large-aperture adjustable-angle ring light source can also be linked with large field-of-view continuous zoom lenses or autofocus platforms to achieve uniform, shadow-free illumination, significantly enhancing the stability of defect recognition and edge segmentation.

The continuous zoom monocular objective (TZM series) adopts a parallel light path and parfocal design at both ends, supporting flexible combinations of multiple magnification auxiliary objectives and TV lenses, achieving an adjustable balance between working distance, magnification, numerical aperture, and field of view range.

It also provides 45 mm / 50 mm bracket adaptations and various mounting accessories, facilitating the quick construction of a complete optical workflow from "large field-of-view inspection" to "high-magnification examination" in applications such as biology, metallography, electronics, semiconductors, mechanical processing, and materials science.

At the system compatibility level, the series products fully support standard C-Mount, 23.2 mm eyepiece tubes, and mainstream trinocular photo ports, and can seamlessly connect with microscope platforms of different brands through multi-specification adapters and mechanical brackets.

Users can start with a single module (such as adding HDMI display or uniform lighting to a microscope) and gradually expand to a complete digital solution, maximizing the reuse of existing equipment and reducing transformation costs.

ToupTek Photonics' Intelligent Imaging Accessories focus on modularity, standardization, and engineering reliability, providing "easy to set up, stable to use, and easily expandable" imaging infrastructure for laboratories, production lines, and teaching scenarios.

Combined with compatible cameras (sold separately) and software, it can complete an efficient closed-loop workflow from real-time observation, photo/video capture to basic measurements without the need for a computer or under low-load computing conditions.

The key features of ToupTek Photonics' Intelligent Imaging Accessories Series are as follows:

- **Modular Ecosystem:** Includes 4K/1080P displays (touch/non-touch), LED ring/polarized/coaxial/transmitted light sources, continuous zoom monocular objectives (TZM series), and various brackets and adapters for free combination and plug-and-play use.
- **High-Quality Display:** Choice of AM-OLED and IPS LCD, native 4K/1080P resolution, 178° wide viewing angle, typical 400 cd/m² brightness, and fast response. Supports HDMI input and multi-angle positioning with folding bracket.
- **Convenient Touch Control:** Touch versions support ten-point touch, allowing direct operation of HDMI camera menus and functions, improving on-site operation efficiency.
- **Continuous Zoom Optical Platform:** Parallel light path and parfocal design at both ends, supporting combinations of multiple magnification auxiliary objectives and TV lenses, compatible with 45 mm/50 mm brackets and various lighting modules.
- **Diverse Lighting Solutions:** Offers large-aperture adjustable-angle ring lights, polarized ring lights, coaxial lights, and transmitted bottom lights to meet illumination needs for samples with different materials and surface structures.
- **Wide Compatibility:** Supports standard C-Mount, 23.2 mm eyepiece tubes, and multi-brand microscope interfaces, enabling easy system expansion.
- **Stable and Easy to Use:** Robust structure and reliable connections, suitable for continuous long-term operation in laboratory and industrial production environments.

3 1080P/4K Displays

3.1 TPHD4K133D HDMI OLED Displayer

3.1.1 TPHD4K133D's Basic Characteristic

The TPHD4K133D is a 4K resolution display specifically designed for ToupTek Photonics' HDMI cameras. The TPHD4K133D screen uses AM-OLED technology and features full viewing angles (approaching 178°) and high contrast characteristics.

The TPHD4K133D is a non-touch screen that can be paired with HDMI cameras to build an integrated imaging and display system that is flexible and intuitive. The high-quality display characteristics of the TPHD4K133D fully leverage the capabilities of HDMI cameras.

- True 4K resolution, meeting most application needs
- Effective display size of 13.3 inches
- IPS hard screen technology with 178° ultra-wide viewing angle
- HDR technology for dynamic image enhancement
- 100% DCI-P3 native color gamut
- Maximum 400 cd/m² display brightness with contrast ratio up to 100000:1
- 4 mm three-sided narrow bezel design with high screen-to-body ratio for stunning visual experience
- 3 ms response time with imperceptible delay, optimized dynamic clarity maintaining stable, clear images without ghosting
- Standard HDMI interface for more secure connection and stable signal transmission
- Connect to computer for screen mirroring, split-screen, and extended display operations
- Integrated invisible folding stand for easy multi-angle adjustment
- Using the folding stand, the HDMI camera and display can be connected together

3.1.2 TPHD4K133D's Datasheet(1)

Order Code	Active Area(Inch)	Video Fomat	Resolution	Contrast	Color Gamut	View Angle
TPHD4K133D	13.3	HDMI	4K	100000:1	100% DCI-P3	IPS Full View(178°)

TPHD4K133D Datasheet

Basic Performance	
LCD Panel	AM-OLED
Input Video Format	HDMI
Native Resolution	3840 x 2160
Display Type	16:9 Ratio 13.3 Inch Active Matrix Super TFT LCD
Typical Contrast Ratio	100000:1
Colors	10.7 Million
Viewing Angle(L/R/U/D)	IPS Full View(178°)
Active Display Area	295mm(W) × 165mm(H)
Pixel Pitch	0.154(W) X 0.154(H) mm
Refresh Rate	60Hz
Brightness	400cd/m2
Backlight	OLED Self Luminous
Outline Parameter	
Color	Black
Dimension	306(L)*183(H)*8(T) mm
Weight	560g
Operating Environment	
Operating Temperature	-15 Degree~55 Degree
Humidity Non Condensing	Operating:10%-90%, Storage: 5%-90%
Synchronization Range	30-80 KHz Horizontal, 55-75 Hz Vertical
Power Supply	AC110V-220V /DC5~12V(1A) (Type C)
Power Consumption	Max 12W

3.1.3 TPHD4K133D and XCAM Series HDMI Camera

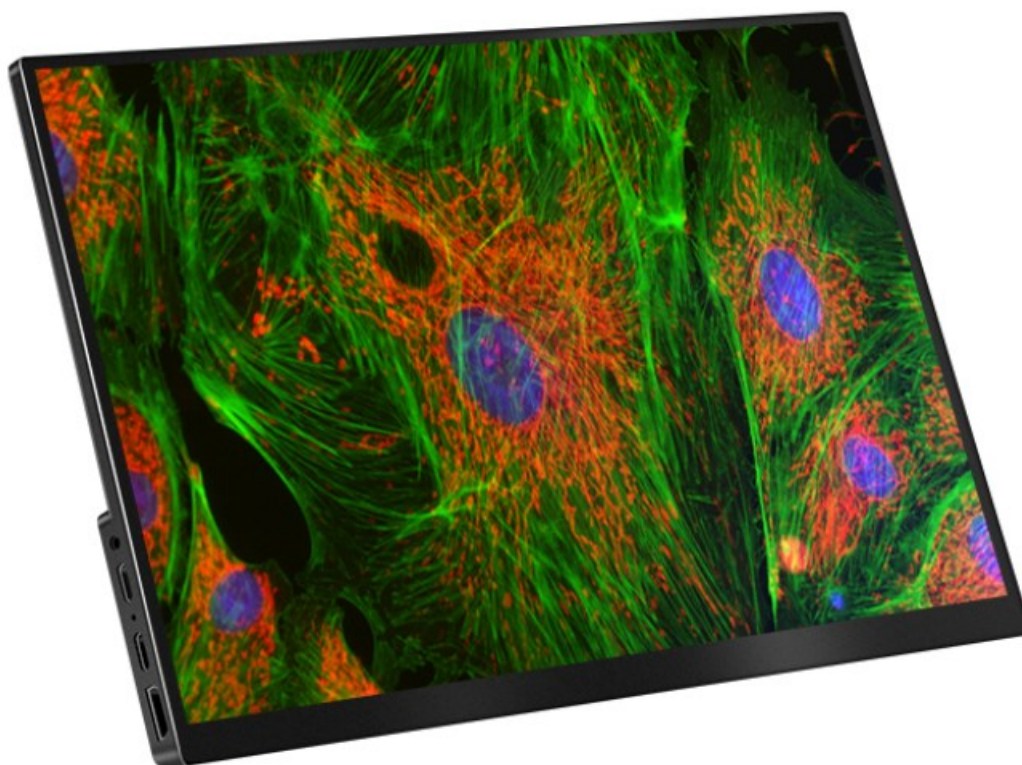


Figure 3-1 Front View of TPHD4K133D Displayer

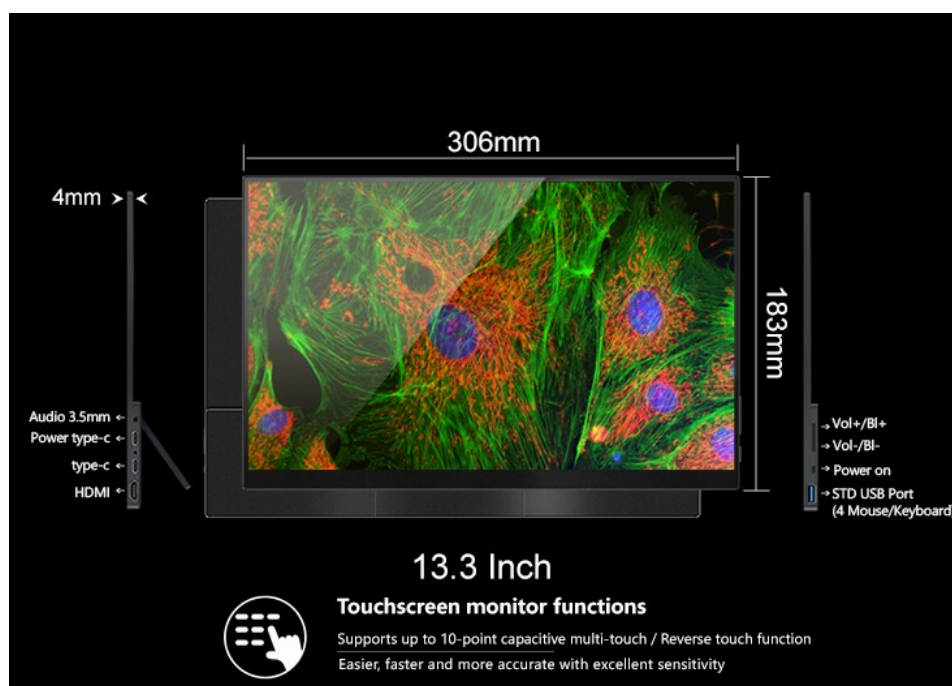


Figure 3-2 Dimension, Interface and Control Button of TPHD4K133D Displayer



Figure 3-3 Integrated Invisible Folding Support of TPHD4K133D Displayer



Figure 3-4 Right Side View of TPHD4K133D Displayer and XCAM Series HDMI Camera's Connection



Figure 3-5 Back View of TPHD4K133D Displayer and XCAM Series HDMI Camera's Connection



Figure 3-6 TPS300A Stand, Monocular Zoom Objective (TZM0480), XCAM Series HDMI Camera and TPHD4K133D Displayer

3.2 TPHD1080PD HDMI Displayer

3.2.1 TPHD1080PD's Basic Characteristic

TPHD1080PD is born with ToupTek's **XCAM** series **HDMI** camera and can be used for high definition display. It adopts IPS LCD panel(Super TFT) to guarantee the wide view angle and high contrast. Together with **XCAM HDMI** camera, **TPHD1080PD** could make the imaging & display solution simple, flexible and intuitive. Outstanding performance of **TPHD1080PD** helps **XCAM HDMI** camera reach fast frame rate and excellent color. The HDMI camera with touch function is connected with **TP2HD1080PD** touchscreen monitor, can easily realize touch operation of camera function.

The **TPHD1080PD**'s basic characteristic is as follows

- TPHD1080PD(General model)/TP2HD1080PD(Touchscreen model)
- True 1080P HDMI displayer
- 13.3 inch active area
- IPS LCD panel, 178 degree wide viewing angle
- HDR dynamic image enhancement
- 72% SRGB primary gamut
- 400cd/m² display brightness, high contrast ratio up to 1000:1
- 4mm narrow frame design on three sides, with 90% of the screen area, great visual experience
- No delay is felt with 3ms response, and dynamic definition is optimized to keep the picture stable and clear without residual shadow
- Standard HDMI interface
- Connect computer to realize screen projection, splitting and expansion
- Integrated invisible folding support, easy viewing angle adjustment
- Easy to connect with HDMI camera

3.2.2 TPHD1080PD Datasheet(1)

Order Code	Active Area(Inch)	Video Fomat	Resolution	Contrast	Color Gamut	View Angle	Touch Function
TPHD1080PD	13.3	HDMI	1080P	1000:1	72%	IPS Full View(178°)	NA

TPHD1080PD Datasheet

Basic Performance	
TPHD1080PD	Common/touch, 2 means square
LCD Panel	IPS LCD Screen(Super TFT)
Input Video Format	HDMI
Display Type	16:9 Ratio 13.3 Inch Active Matrix Super TFT LCD
Typical Contrast Ratio	1000:1
Colors	16.7 Million
Viewing Angle(L/R/U/D)	IPS Full View(178°)
Active Display Area	295mm(W) × 165mm(H)
Pixel Pitch	0.154(W) X 0.154(H) mm
Refresh Rate	60Hz
Brightness	400cd/m2
Backlight	LED Backlight, 50000 hours
Outline Parameter	
Color	Black
Dimension	306(L)*183(H)*8(T) mm
Weight	450g
Operating Environment	
Operating Temperature	-15 Degree~55 Degree
Humidity Non Condensing	Operating:10%-90%, Storage: 5%-90%
Synchronization Range	30-80 KHz Horizontal, 55-75 Hz Vertical
Power Supply	AC110V-220V /DC5~12V(1A) (Type C)
Power Consumption	Max 12W

3.2.3 TPHD1080PD and XCAM Series HDMI Camera

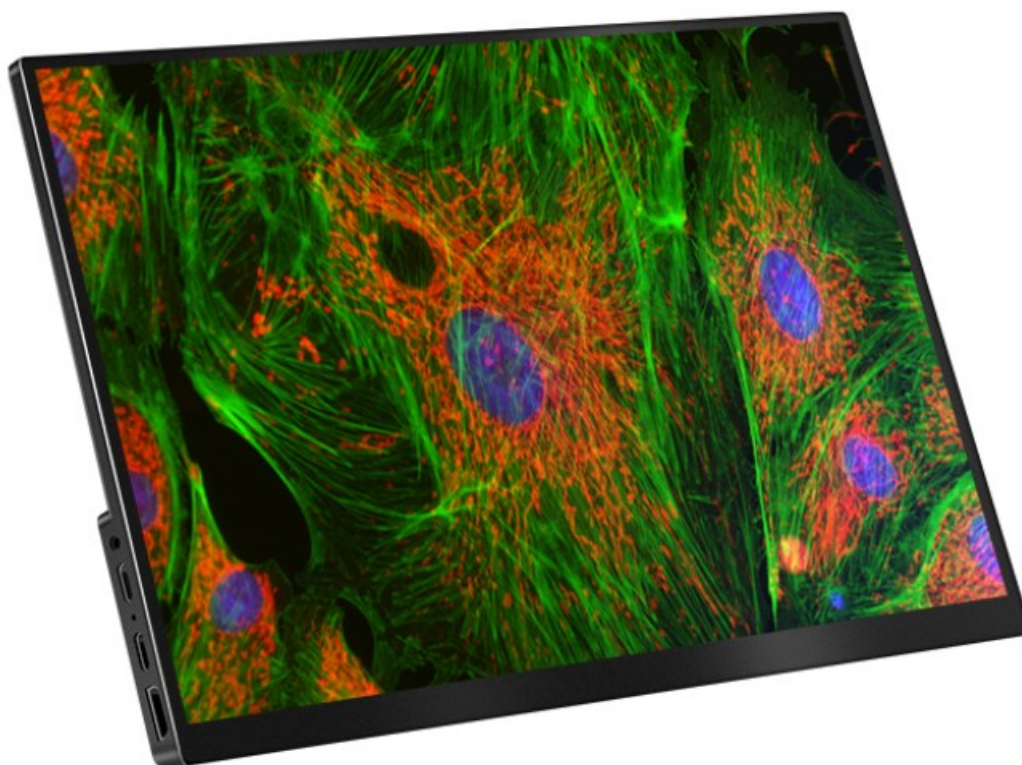


Figure 3-7 Front View of TPHD1080PD Displayer

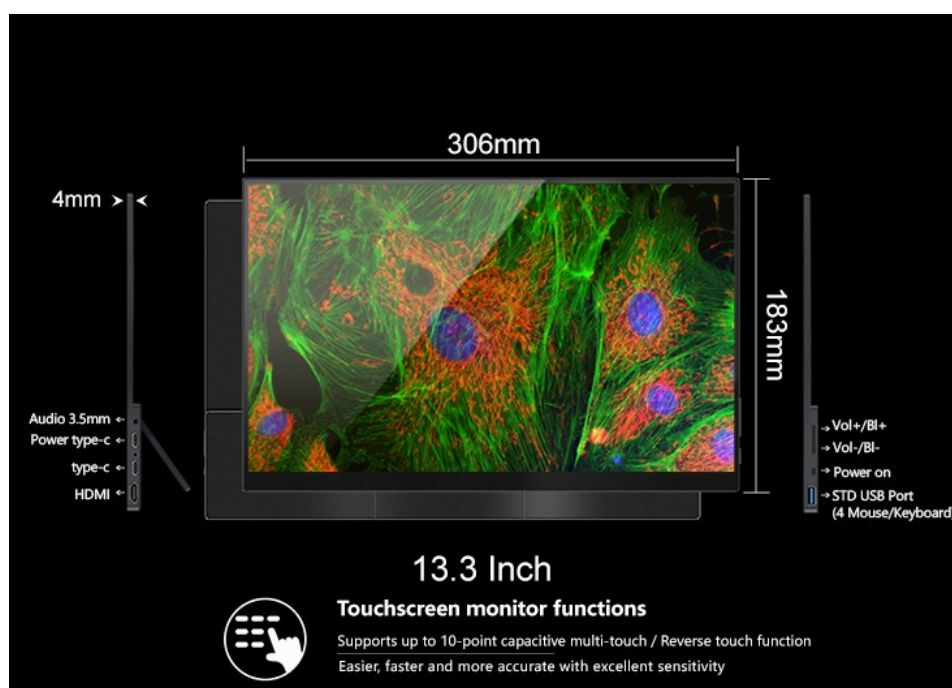


Figure 3-8 Dimension, Interface and Control Button of TPHD1080PD Displayer

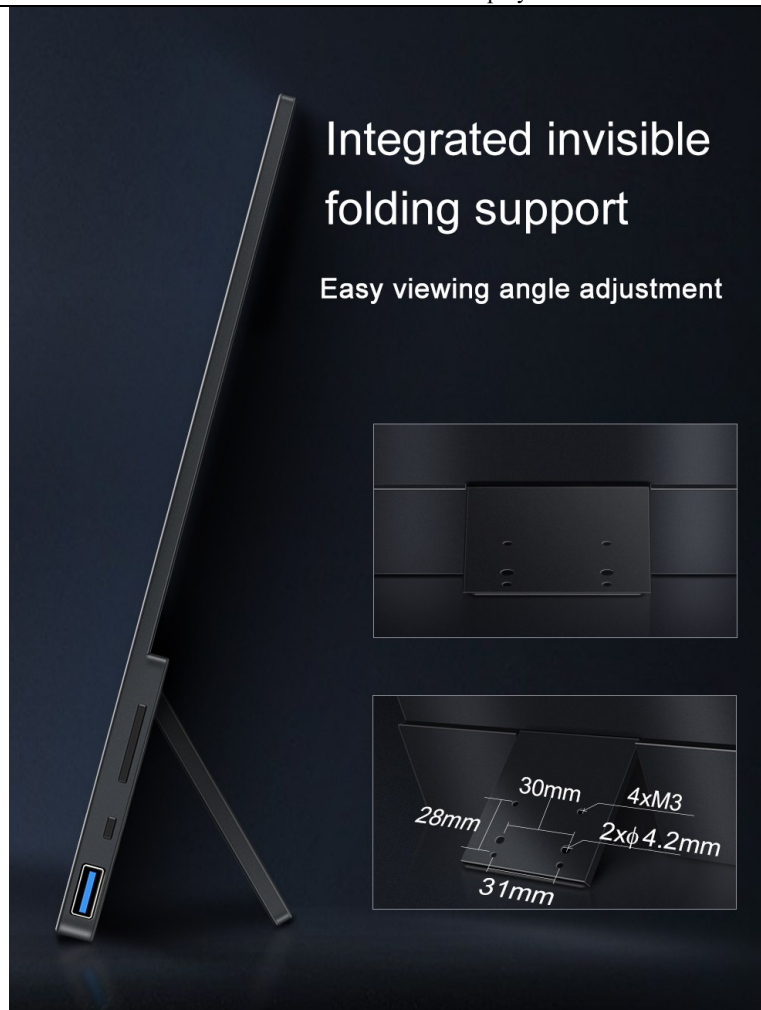


Figure 3-9 Integrated Invisible Folding Support of TPHD1080PD Displayer



Figure 3-10 Right Side View of TPHD1080PD Displayer and XCAM Series HDMI Camera's Connection



Figure 3-11 Back View of TPHD1080PD Displayer and XCAM Series HDMI Camera's Connection



Figure 3-12 TPS300A Stand, Monocular Zoom Objective (TZM0480), XCAM Series HDMI Camera and TPHD1080PD Displayer

3.3 TPHD1080P156A HDMI Displayer

3.3.1 TPHD1080P156A's Basic Characteristic

TPHD1080P156A is born with ToupTek' HDMI camera and can be used for high definition display. It adopts IPS LCD panel(Super TFT) to guarantee the wide view angle and high contrast.

TPHD1080P156A is a regular mouse screen that can be paired with an HDMI camera to create an integrated imaging and display system, which is flexible and intuitive. At the same time, the high-quality display characteristics of TPHD1080P156A can fully utilize the features of an HDMI camera.

- True 1080P HDMI displayer
- 15.6 inch active area
- IPS LCD panel, 178 degree wide viewing angle
- HDR dynamic image enhancement
- 72% SRGB primary gamut
- Maximum 400cd/m² display brightness, high contrast ratio up to 1200:1
- 4mm narrow frame design on three sides, with 96% of the screen area, great visual experience
- No delay is felt with 3ms response, and dynamic definition is optimized to keep the picture stable and clear without residual shadow
- Standard HDMI interface
- Connect computer to realize screen projection, splitting and expansion
- Integrated invisible folding support, easy viewing angle adjustment
- Easy to connect with HDMI camera
- Camera and Monitor power: **12V/2A**

3.3.2 TPHD1080P156A Datasheet

Order Code	Active Area (Inch)	Video Fomat	Resolution	Contrast	Color Gamut	View Angle	Touch Function
TPHD1080P156A	15.6	HDMI	1080P	1200:1	72% SRGB	IPS Full View(178°)	NA

TPHD1080P156A Datasheet

TPHD1080P156A	
Basic Performance	
Panel Type	Common
LCD Panel	IPS LCD Screen (Super TFT)
Input Video Format	HDMI
Native Resolution	1920 x 1080
Display Type	16:9 Ratio 15.6 Inch Active Matrix Super TFT LCD
Typical Contrast Ratio	1200:1
Colors	16.7 Million
Viewing Angle(L/R/U/D)	IPS Full View (178°)
Active Display Area	344.16mm(W) × 193.59mm(H)
Pixel Pitch	0.179(W) X 0.179(H) mm
Refresh Rate	60Hz
Brightness	400cd/m2
Backlight	LED Backlight (50000 hours)
Outline Parameter	
Color	Black
Dimension	356.1(L)*213.21(H)*11.8(T) mm
Weight	750g
Operating Environment	
Operating Temperature	0 Degree~40 Degree
Humidity Non Condensing	Operating:10%-80%, Storage: 5%-90%
Synchronization Range	148.5 KHz Horizontal, 60 Hz Vertical
Power Supply	AC100V-240V /DC12V(3A) (Type C)
Power Consumption	Max 15W

3.3.3 TPHD1080P156A and HDMI Camera



Figure 3-13 Front View of TPHD1080P156A Displayer



Figure 3-14 Dimension, Interface and Control Button of TPHD1080P156A Displayer



Figure 3-15 Integrated Invisible Folding Support of TPHD1080P156A Displayer



Figure 3-16 Right Side View of TPHD1080P156A Displayer and AFDM Series HDMI Camera's Connection



Figure 3-17 Back View of TPHD1080P156A Displayer and AFDM Camera's Connection



Figure 3-18 TPS210A50 Stand, AFDM Camera and TPHD1080P156A Displayer

4 1080P/4K Touchscreen Displays

4.1 TP2HD4K133D Touchscreen HDMI OLED Display

4.1.1 TP2HD4K133D Basic Features

The TP2HD4K133D is a 4K resolution display specifically designed for ToupTek Photonics' HDMI cameras. The TP2HD4K133D screen uses AM-OLED technology and features full viewing angles (approaching 178°) and high contrast characteristics.

The TP2HD4K133D is an OLED touch screen that can be paired with HDMI cameras to build an integrated imaging and display system that is flexible and intuitive. The high-quality display characteristics of the TP2HD4K133D fully leverage the capabilities of HDMI cameras.

- True 4K resolution, meeting most application needs
- Effective display size of 13.3 inches
- IPS hard screen technology with 178° ultra-wide viewing angle
- HDR technology for dynamic image enhancement
- 100% DCI-P3 native color gamut
- Maximum 400 cd/m² display brightness with contrast ratio up to 100000:1
- 4 mm three-sided narrow bezel design with high screen-to-body ratio for stunning visual experience
- 3 ms response time with imperceptible delay, optimized dynamic clarity maintaining stable, clear images without ghosting
- Standard HDMI interface for more secure connection and stable signal transmission
- Connect to computer for screen mirroring, split-screen, and extended display operations
- Integrated invisible folding stand for easy multi-angle adjustment
- Using the folding stand, the HDMI camera and display can be connected together

4.1.2 TP2HD4K133D's Datasheet(1)

Order Code	Active Area(Inch)	Video Fomat	Resolution	Contrast	Color Gamut	View Angle
TP2HD4K133D	13.3	HDMI	4K	100000:1	100% DCI-P3	IPS Full View(178°)

TP2HD4K133D Datasheet

Basic Performance	
LCD Panel	AM-OLED
Input Video Format	HDMI
Native Resolution	3840 x 2160
Display Type	16:9 Ratio 13.3 Inch Active Matrix Super TFT LCD
Typical Contrast Ratio	100000:1
Colors	10.7 Million
Viewing Angle(L/R/U/D)	IPS Full View(178°)
Active Display Area	295mm(W) × 165mm(H)
Pixel Pitch	0.154(W) X 0.154(H) mm
Refresh Rate	60Hz
Brightness	400cd/m2
Backlight	OLED Self Luminous
Outline Parameter	
Color	Black
Dimension	306(L)*183(H)*8(T) mm
Weight	560g
Operating Environment	
Operating Temperature	-15 Degree~55 Degree
Humidity Non Condensing	Operating:10%-90%, Storage: 5%-90%
Synchronization Range	30-80 KHz Horizontal, 55-75 Hz Vertical
Power Supply	AC110V-220V /DC5~12V(1A) (Type C)
Power Consumption	Max 12W

4.1.3 TP2HD4K133D and XCAM Series HDMI Camera

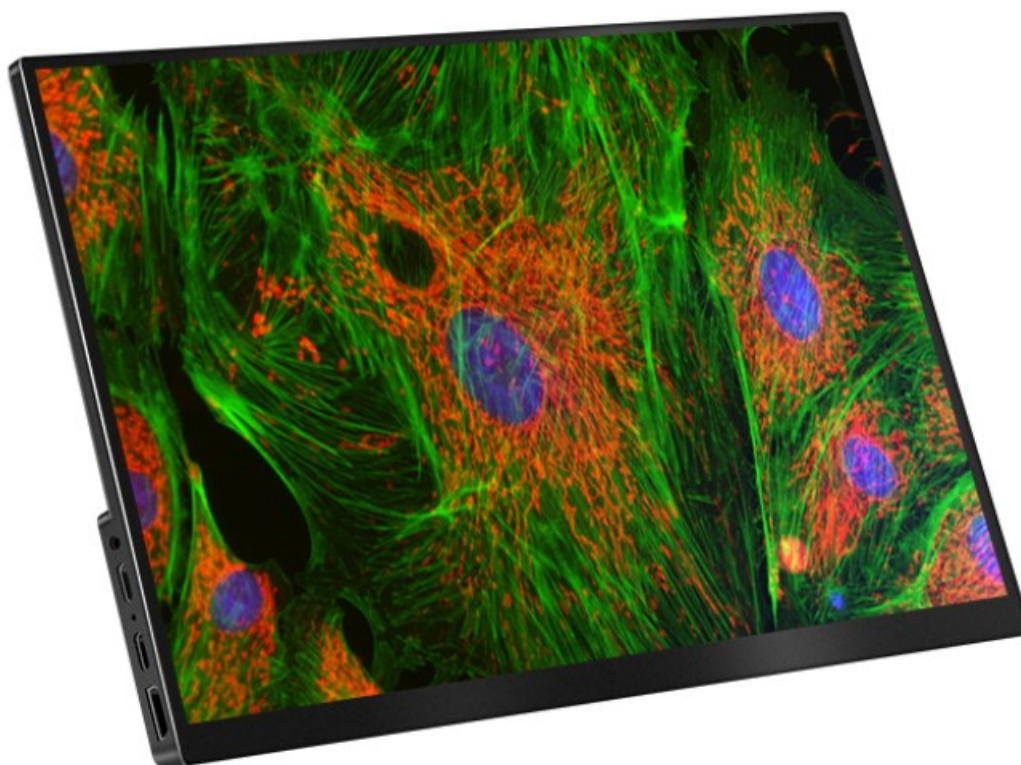


Figure 4-1 Front View of TP2HD4K133D Displayer

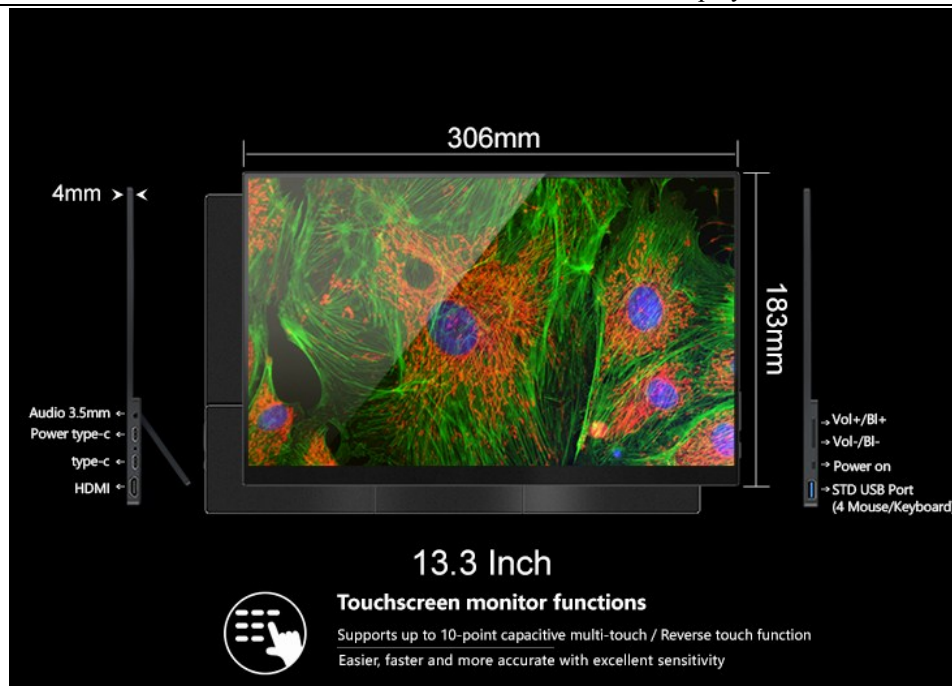


Figure 4-2 Dimension, Interface and Control Button of TP2HD4K133D Displayer

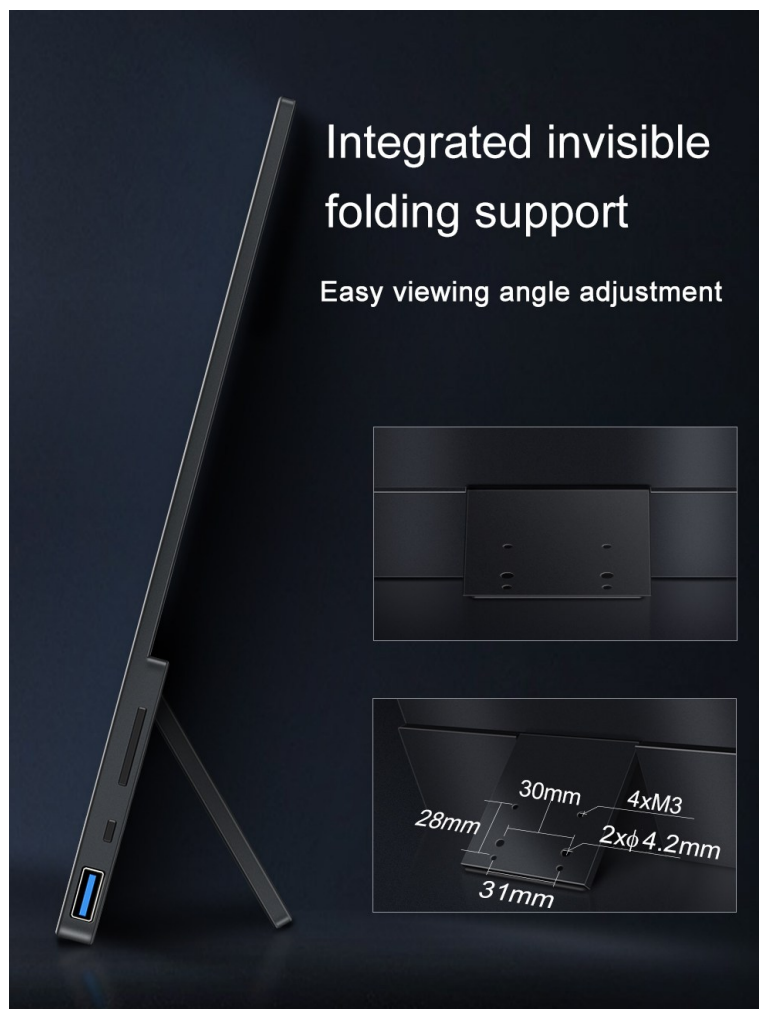


Figure 4-3 Integrated Invisible Folding Support of TP2HD4K133D Displayer



Figure 4-4 Right Side View of TP2HD4K133D Displayer and XCAM Series HDMI Camera's Connection



Figure 4-5 Back View of TPHPD4K133D Displayer and XCAM Series HDMI Camera's Connection



Figure 4-6 TPS300A Stand, Monocular Zoom Objective (TZM0480), XCAM Series HDMI Camera and TPHD4K133D Displayer

4.2 TP2HD4K133B Touchscreen HDMI LCD Displayer

4.2.1 TP2HD4K133B's Basic Characteristic

TP2HD4K133B is born with ToupTek's [XCAM](#) series [HDMI](#) camera and can be used for high definition display. It adopts IPS LCD panel(Super TFT) to guarantee the wide view angle and high contrast. Together with [XCAM HDMI](#) camera, [TP2HD4K133B](#) could make the imaging & display solution simple, flexible and intuitive. Outstanding performance of [TP2HD4K133B](#) helps [XCAM HDMI](#) camera reach fast frame rate and excellent color. The HDMI camera with touch function is connected with [TP2HD4K133B](#) touchscreen monitor, can easily realize touch operation of camera function.

The [TP2HD4K133B](#)'s basic characteristic is as follows

- TP2HD4K133B(Touchscreen model)
- True 4K HDMI displayer
- 13.3 inch active area
- IPS LCD panel, 178 degree wide viewing angle
- HDR dynamic image enhancement
- 100% SRGB primary gamut
- 400cd/m² display brightness, high contrast ratio up to 1000:1
- 4mm narrow frame design on three sides, with 90% of the screen area, great visual experience
- No delay is felt with 3ms response, and dynamic definition is optimized to keep the picture stable and clear without residual shadow
- Standard HDMI interface
- Connect computer to realize screen projection, splitting and expansion
- Integrated invisible folding support, easy viewing angle adjustment
- Easy to connect with HDMI camera

4.2.2 TP2HD4K133B Datasheet(1)

Order Code	Active Area(Inch)	Video Fomat	Resolution	Contrast	Color Gamut	View Angle
TP2HD4K133B	13.3	HDMI	4K	1000:1	100%	IPS Full View(178°)

TP2HD4K133B Datasheet

Basic Performance	
LCD Panel	IPS LCD Screen(Super TFT)
Input Video Format	HDMI
Native Resolution	3840 x 2160
Display Type	16:9 Ratio 13.3 Inch Active Matrix Super TFT LCD
Typical Contrast Ratio	1000:1
Colors	16.7 Million
Viewing Angle(L/R/U/D)	IPS Full View(178°)
Active Display Area	295mm(W) × 165mm(H)
Pixel Pitch	0.154(W) X 0.154(H) mm
Refresh Rate	60Hz
Brightness	400cd/m2
Backlight	LED Backlight, 50000 hours
Outline Parameter	
Color	Black
Dimension	306(L)*183(H)*8(T) mm
Weight	560g
Operating Environment	
Operating Temperature	-15 Degree~55 Degree
Humidity Non Condensing	Operating:10%-90%, Storage: 5%-90%
Synchronization Range	30-80 KHz Horizontal, 55-75 Hz Vertical
Power Supply	AC110V-220V /DC5~12V(1A) (Type C)
Power Consumption	Max 15W

4.2.3 TP2HD4K133B and XCAM Series HDMI Camera

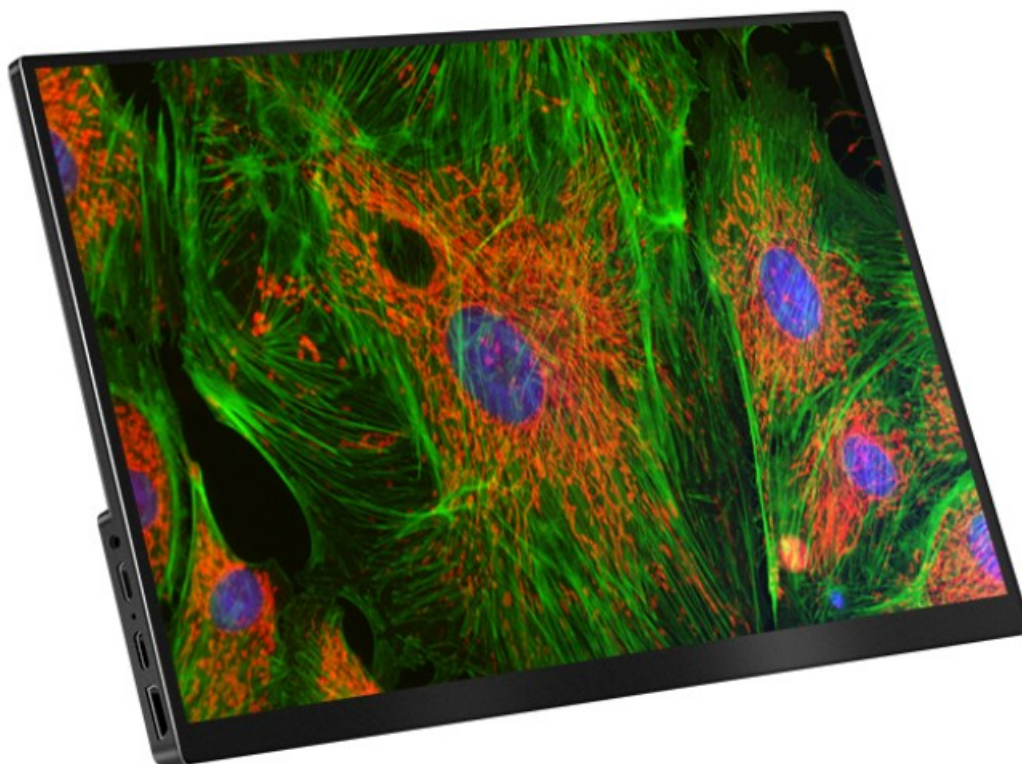


Figure 4-7 Front View of TP2HD4K133B Displayer

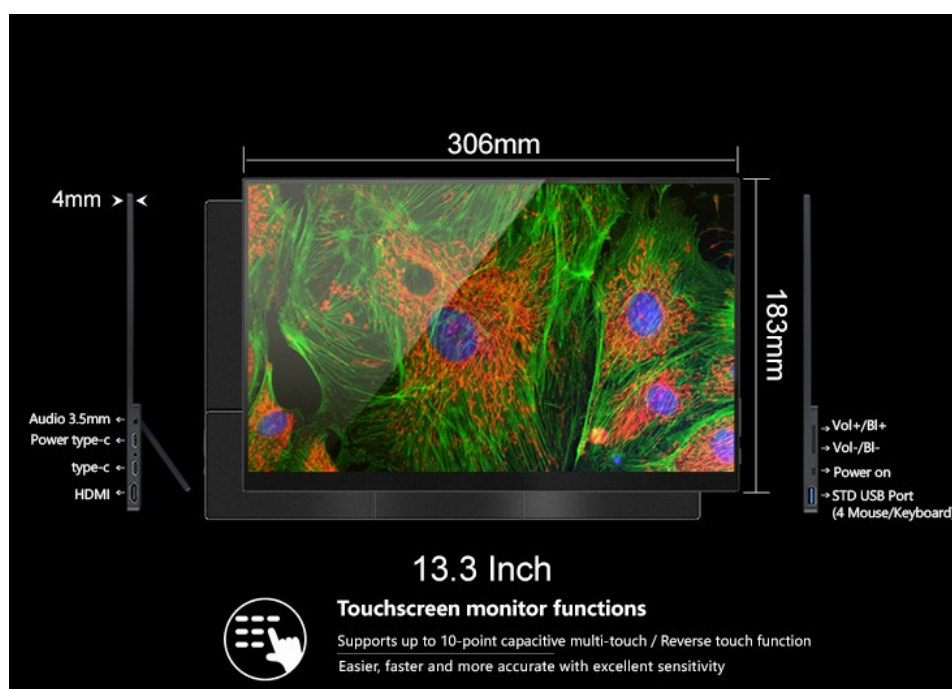


Figure 4-8 Dimension, Interface and Control Button of TP2HD4K133B Displayer

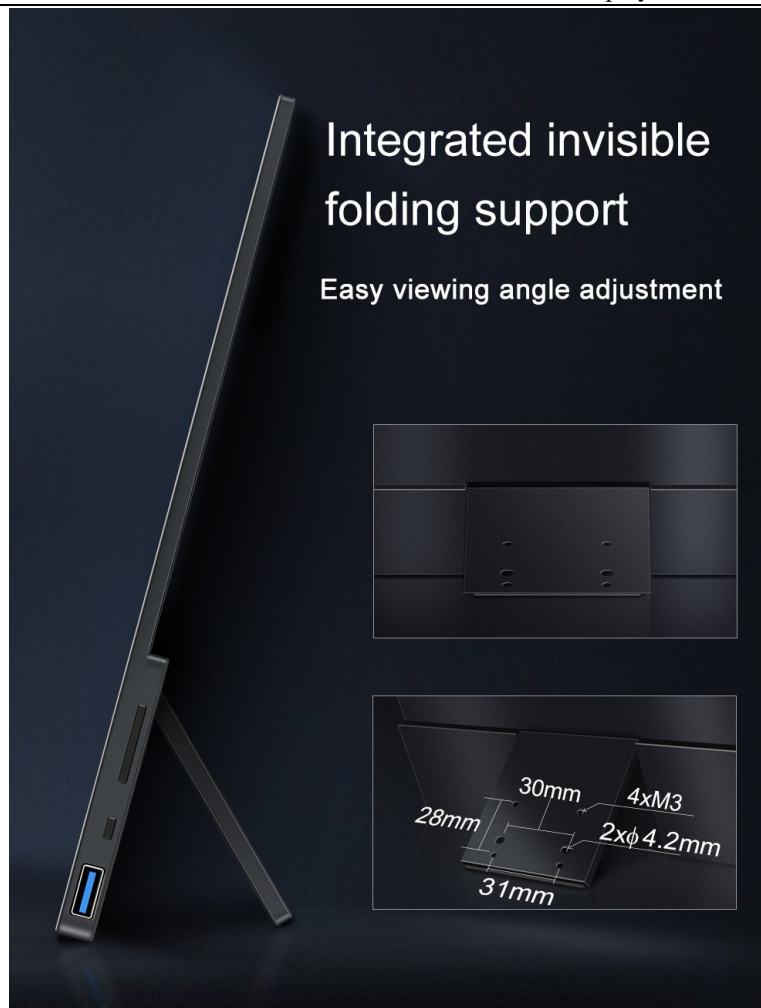


Figure 4-9 Integrated Invisible Folding Support of TP2HD4K133B Displayer



Figure 4-10 Right Side View of TP2HD4K133B Displayer and XCAM Series HDMI Camera's Connection



Figure 4-11 Back View of TP2HD4K133B Displayer and XCAM Series HDMI Camera's Connection



Figure 4-12 TPS300A Stand, Monocular Zoom Objective (TZM0480), XCAM Series HDMI Camera and TP2HD4K133B Displayer

4.3 TP2HD1080PD HDMI Displayer

4.3.1 TP2HD1080PD's Basic Characteristic

The TP2HD1080PD is specifically designed for ToupTek Photonics' XCAM series HDMI cameras, enabling direct video display output from XCAM series cameras. The TP2HD1080PD screen utilizes an IPS LCD panel (also known as Super TFT display), featuring full viewing angles (nearly 178 degrees) and high contrast characteristics. The TP2HD1080PD is available in two different models: standard and touchscreen versions.

When paired with XCAM series HDMI cameras, the TP2HD1080PD creates an integrated imaging and display system that is both flexible and intuitive. The high-quality display characteristics of the TP2HD1080PD fully leverage the capabilities of XCAM series HDMI cameras. Cameras with touch functionality, when connected to the TP2HD1080PD touchscreen, enable effortless touch-based operation of camera functions.

- The touchscreen features ten-point multi-touch capability with instant response
- True 1080P resolution meets the requirements of most applications
- Effective display size reaches 3 inches
- IPS technology hard screen with 178° ultra-wide viewing angle
- HDR technology for dynamic image enhancement
- 72% sRGB native color gamut
- 400 cd/m² display brightness with contrast ratio up to 1000:1
- 4 mm three-sided narrow bezel design with screen-to-body ratio reaching 90% for stunning visual experience
- 3 ms response time with imperceptible delay, optimized dynamic clarity maintains stable, clear images without ghosting
- Standard HDMI interface ensures more secure connection and stable signal transmission
- Connect to computers for screen mirroring, split-screen, and extended display operations
- Integrated hidden folding stand enables easy multi-angle adjustment
- Using the folding stand, HDMI cameras and HDMI displays can be connected together

4.3.2 TP2HD1080PD Datasheet(2)

Order Code	Active Area(Inch)	Video Fomat	Resolution	Contrast	Color Gamut	View Angle	Touch Function
TP2HD1080PD	13.3	HDMI	1080P	1000:1	72%	IPS Full View(178°)	Available

TP2HD1080PD Datasheet

Basic Performance	
TP2HD1080PD	Common/touch, 2 means square
LCD Panel	IPS LCD Screen(Super TFT)
Input Video Format	HDMI
Native Resolution	1920 x 1080
Display Type	16:9 Ratio 13.3 Inch Active Matrix Super TFT LCD
Typical Contrast Ratio	1000:1
Colors	16.7 Million
Viewing Angle(L/R/U/D)	IPS Full View(178°)
Active Display Area	295mm(W) × 165mm(H)
Pixel Pitch	0.154(W) X 0.154(H) mm
Refresh Rate	60Hz
Brightness	400cd/m2
Backlight	LED Backlight, 50000 hours
Outline Parameter	
Color	Black
Dimension	306(L)*183(H)*8(T) mm
Weight	450g
Operating Environment	
Operating Temperature	-15 Degree~55 Degree
Humidity Non Condensing	Operating:10%-90%, Storage: 5%-90%
Synchronization Range	30-80 KHz Horizontal, 55-75 Hz Vertical
Power Supply	AC110V-220V /DC5~12V(1A) (Type C)
Power Consumption	Max 12W

4.3.3 TP2HD1080PD and XCAM Series HDMI Camera

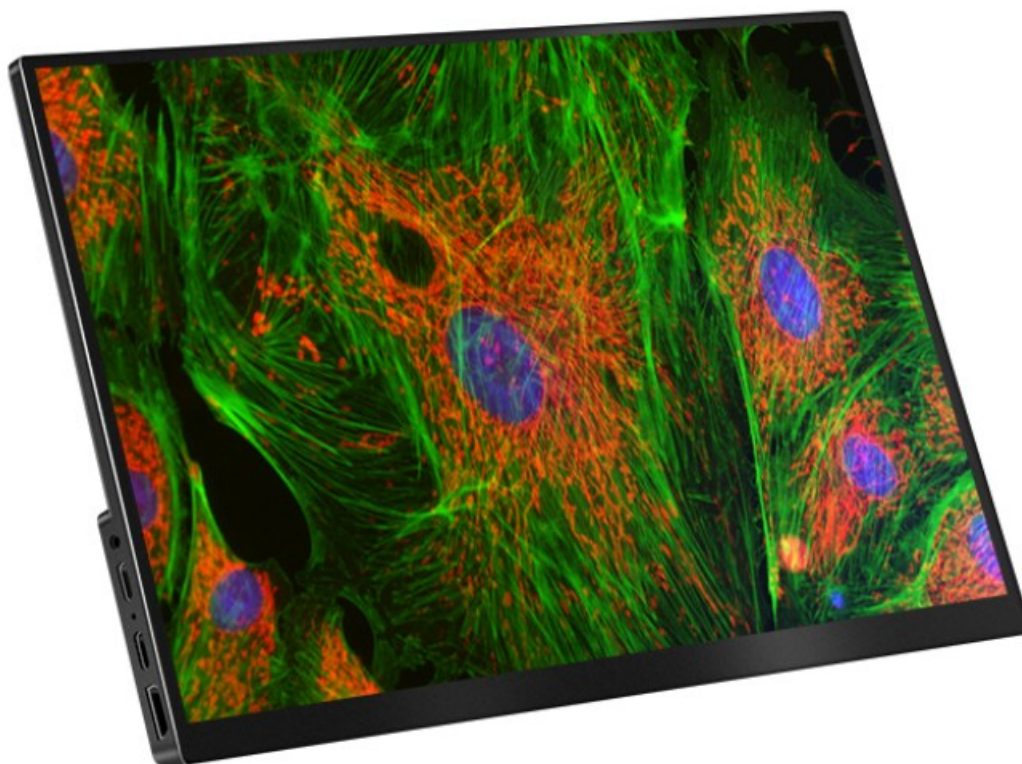


Figure 4-13 Front View of TP2HD1080PD Displayer

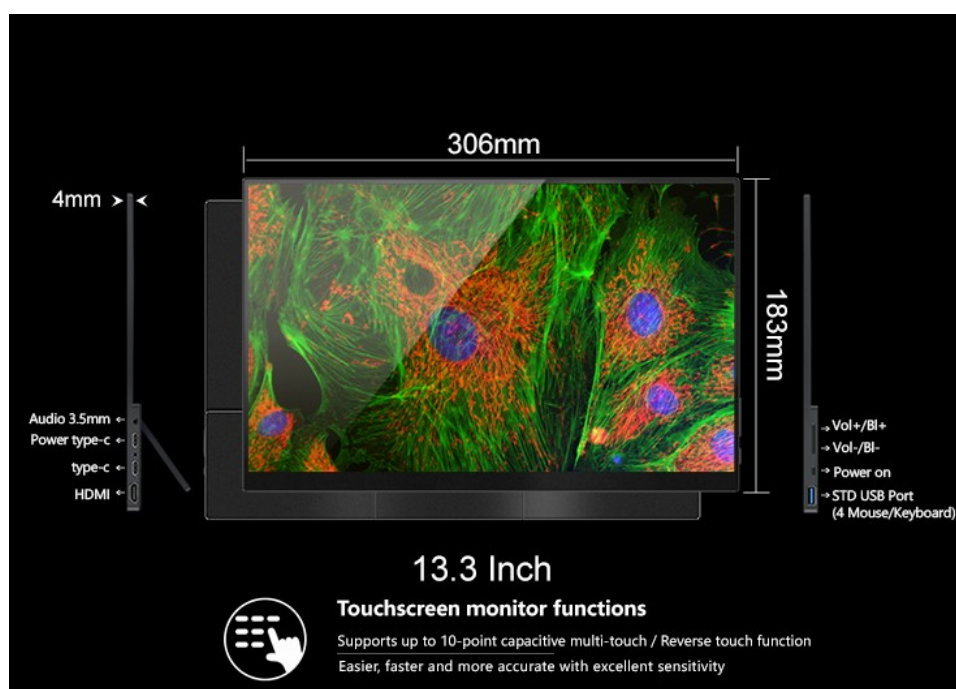


Figure 4-14 Dimension, Interface and Control Button of TPHD1080PHD Displayer

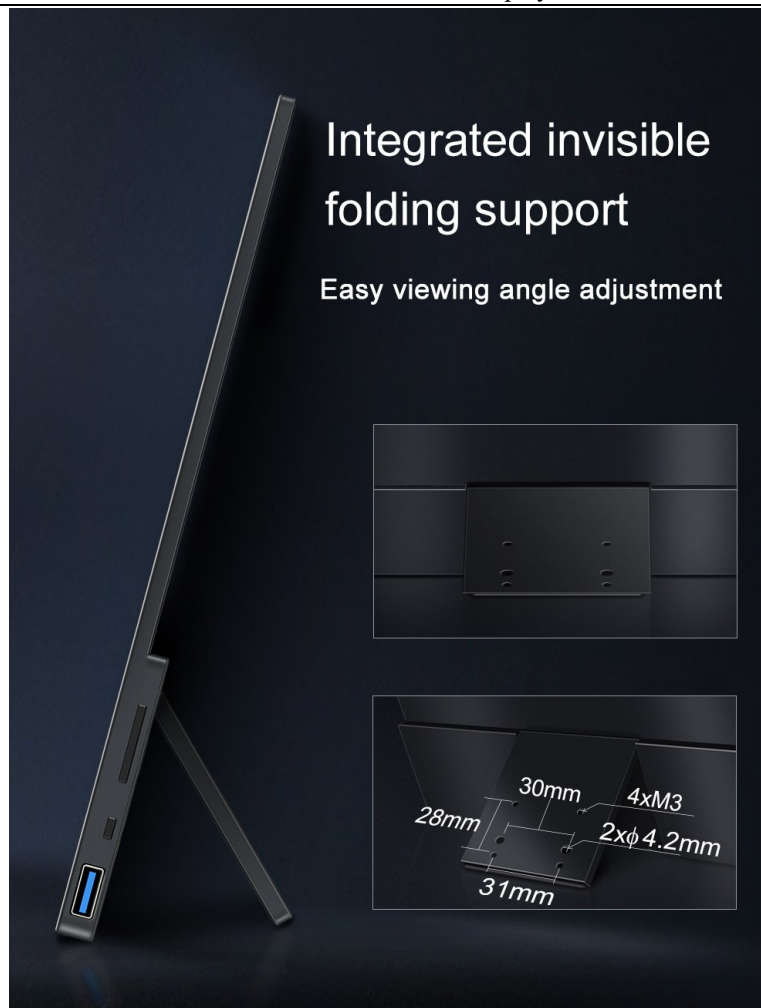


Figure 4-15 Integrated Invisible Folding Support of TPHD1080PHD Displayer



Figure 4-16 Right Side View of TP2HD1080PD Displayer and XCAM Series HDMI Camera's Connection



Figure 4-17 Back View of TP2HD1080PD Displayer and XCAM Series HDMI Camera's Connection



Figure 4-18 TPS300A Stand, Monocular Zoom Objective (TzM0480), XCAM Series HDMI Camera and TP2HD1080PD Displayer

5 Light Source Series

5.1 Introduction of DRL-10040/DRL-10065 Series Direct Ring Light

5.1.1 DRL-10040/DRL-10065 Series Direct Ring Light General Characteristics

The DRL-10040/DRL-10065 series direct ring light is shown in Figure 5-1 and 5.2. It consists of a housing, 18 high-brightness LEDs, and a professionally designed uniform light lens array that matches the LED. It can be applied to common monocular microscopes and stereo microscopes to achieve uniform illumination within a working distance of 80-130 mm.

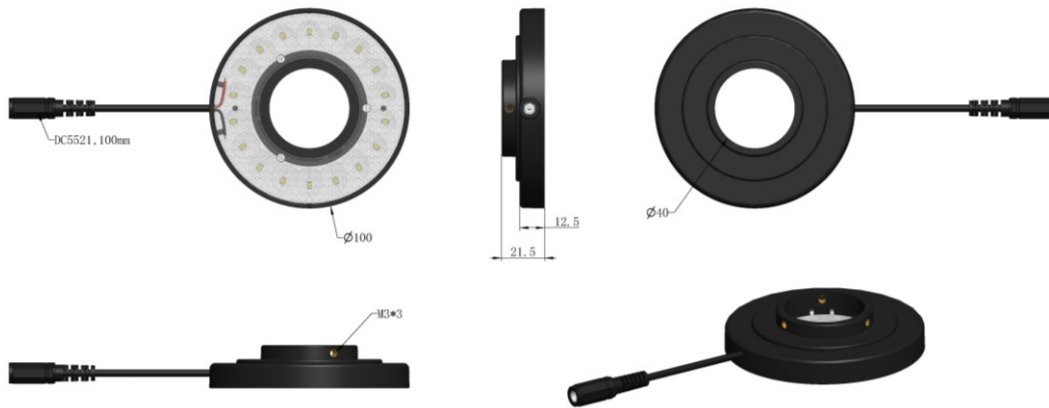


Figure 5-1 Dimensions of DRL-10040 direct ring light

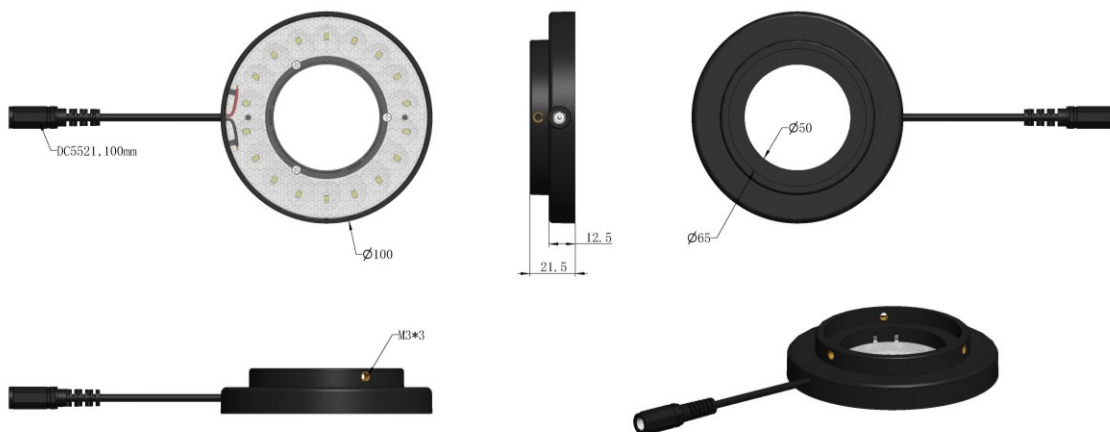


Figure 5-2 Dimensions of DRL-10065 direct ring light

5.1.2 DRL-10040/DRL-10065 Series Direct Ring Light Illuminance Analysis

The illumination distribution diagram of the DRL-10040/DRL10065 series direct ring light at working distance of 40-200mm is shown in Figure 5-3. At a working distance of 80-130mm, the illumination uniformity can reach more than 80%. This solves the problem of uniformity at different working distances.

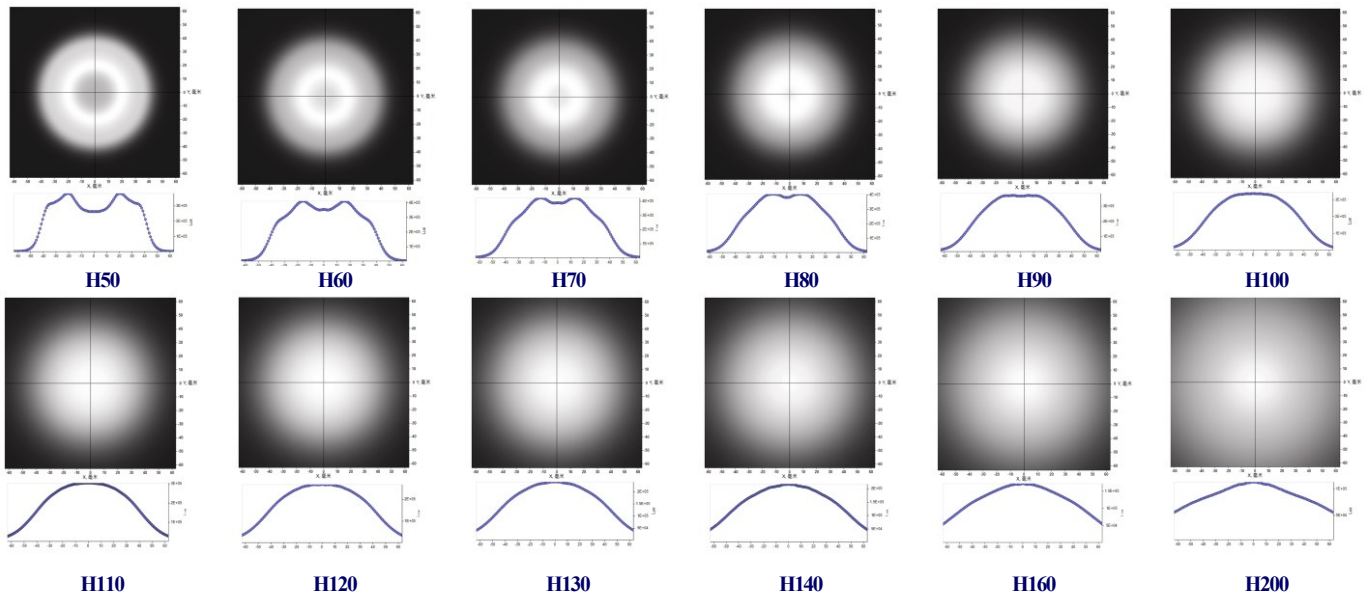


Figure 5-3 Illuminance distribution of DRL-10040/DRL-10065 series direct ring light(working distance 40-200mm)

5.1.3 DRL-10040/DRL-10065 Series Direct Ring Light Optional Models

The available models of DRL-10040/DRL-10065 series direct ring light are shown in the table below. The DRL-10040 has an outer diameter of 100mm and an inner diameter of 40mm, which is suitable for monocular microscopes; the DRL-10065 has an outer diameter of 100mm and an inner diameter of 65mm, which is suitable for traditional stereo microscopes.

Order Number	Dimensions	Installation Inner Diameter	Power
DRL-10040	100mm	40mm	12V1A
DRL-10065	100mm	65mm	12V1A

5.1.4 Installation of DRL-10040/DRL-10065 Series Ring Light

The DRL-10040/DRL-10065 series direct ring light can be installed on a monocular microscope or a stereo microscope. The installation method is shown in Figure 5-4. Install the DRL-10040 on the bottom of the monocular microscope and tighten the mounting screws.



Figure 5-4 DRL-10040 installed on a monocular microscope

5.1.5 DRL-10040/DRL-10065 Series Direct Ring Light Packing List



Figure 5-5 DRL-10040/DRL-10065 series direct ring light packaging diagram

Packing List	
A	Light source packaging box specifications: L: 21.5cm W:12.8cm H: 4.8cm (1pcs, 0.16kg/box)
B	DRL-10040/DRL-10065
C	Ring light modulator
D	Wrench x1/Hexagon socket screw x 3
E	Power adapter: Input: AC 100~240V 50Hz/60Hz, Output: DC 12V 1A (US standard)
F	Power adapter: Input: AC 100~240V 50Hz/60Hz, Output: DC 12V 1A (European standard)
G	Power adapter: Input: AC 100~240V 50Hz/60Hz, Output: DC 12V 1A (UK standard)

5.1.6 Pictures Taken with DRL-10040/DRL-10065 Series Direct Ring Light

The circuit board was photographed using a monocular microscope with an ordinary direct ring light and a DRL-10040. The images of the circuit board taken with the monocular microscope with an ordinary direct ring light are shown in Figure 5-6 and Figure 5-7 on the left. There are strong reflections in some parts on the image and obvious reflections at the circuit board traces. The images of the circuit board taken with the monocular microscope with a DRL-10040 are shown in Figure 5-6 and Figure 5-7 on the right. There is no local reflection on the image and no reflection at the circuit board traces, and the picture is more uniform.

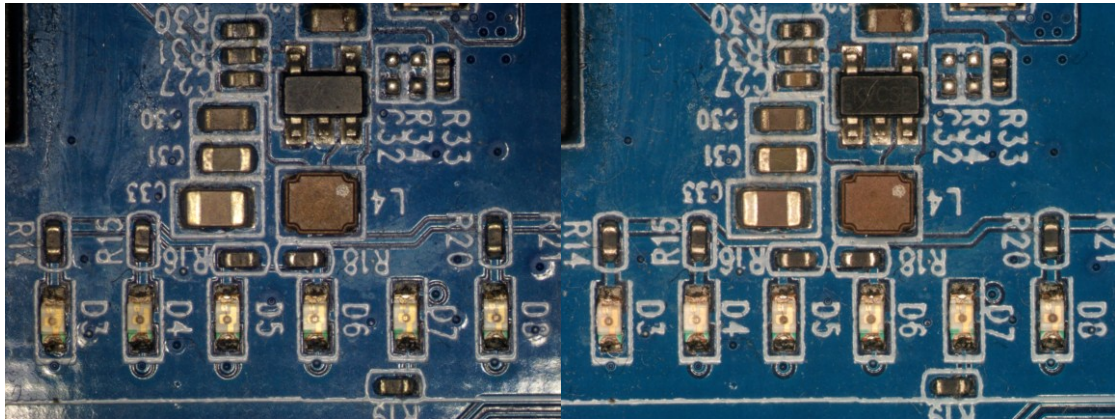


Figure 5-6 Monocular microscope + ordinary direct ring light to shoot the circuit board (left); Monocular microscope + DRL-10040 to shoot the circuit board (right)

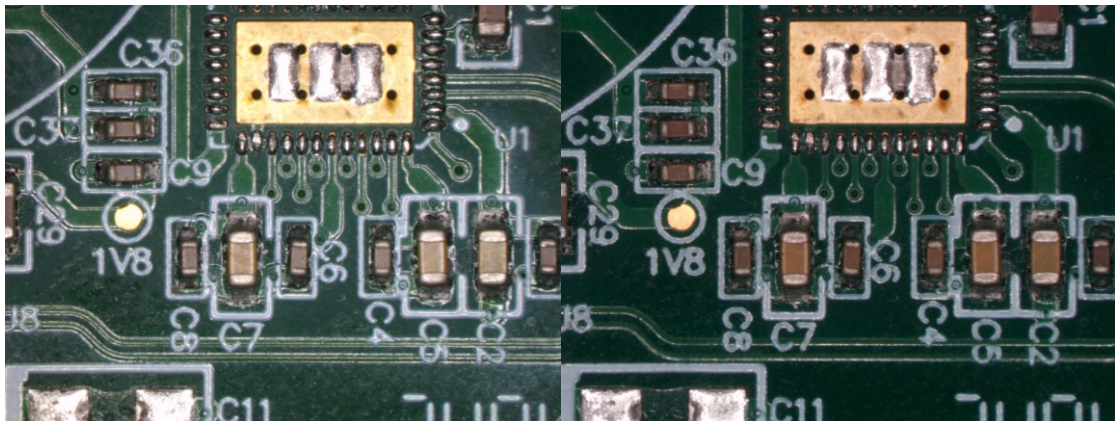


Figure 5-7 Monocular microscope + ordinary direct ring light to shoot the circuit board (left); Monocular microscope + DRL-10040 to shoot the circuit board (right)

5.2 Angle Adjustable LED Ring Light AALRL-200-7650

- Twelve 1 watt LED located on a 202 mm circle
- LED intensity controllable with USB port(AFDM series)
- Single LED on/off switch
- Single LED illumination angle adjustable(left or right 30 degree)
- Power input 12V/2A
- Large FOV(300mm diameter)
- Providing intense and focused shadow-free illumination
- For microscope stand with 75mm diameter bracket
- For monocular zoom object /AFDM with 50mm adaptor

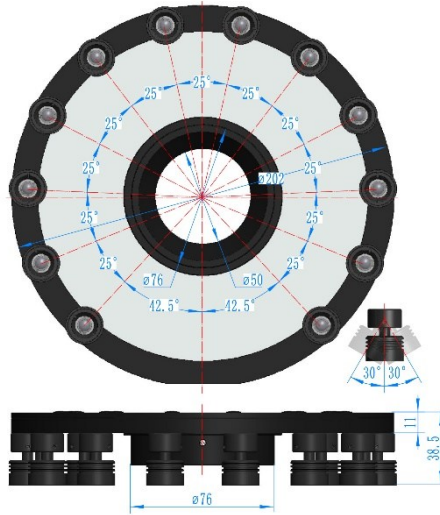


Figure 5-8 Dimension of AALRL-200-7650 Angle Adjustable LED Ring Light

AALRL-200-7650 LED Ring Light is shown in the figure above. Twelve LEDs with individually adjustable angles are distributed on the outer circle with a diameter of 200mm. The mounting column with a diameter of 76mm in the middle can be directly inserted into the microscope bracket hole (such as the A1 bracket of **TPS-30A**). The diameter of the hole in the mounting column is 50mm, and the single barrel or autofocus microscope of the corresponding adaptor can be directly inserted.



Figure 5-9 AALRL-200-7650 under the condition of LED angle, inward and oblique light illumination

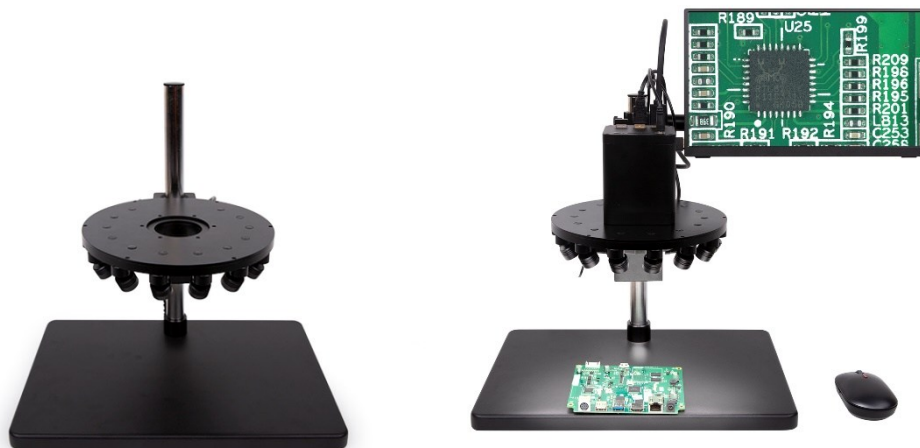


Figure 5-10 TPS-30A+AALRL-200-7650 and TPS-30A+AALRL+AFDM101+SCR

The left figure above shows that [AALRL -200-7650](#) is installed on the microscope bracket of TPS-30A;

The right figure above shows that [AALRL -200-7650](#) is first installed on the microscope bracket of [TPS-30A](#), and then [AFDM101](#) (with 50mm front end diameter) is installed in the mounting hole of [AALRL-200-7650](#).

5.3 The Light Source for TzM0756 MZO

This light source is also suitable for TzM0756, TzM0745A, TzM0480, TzM0460, TzM0440, TzM0660, TzM0640 and TzM0880 MZO.

5.3.1 TzM0756 Series Light Source

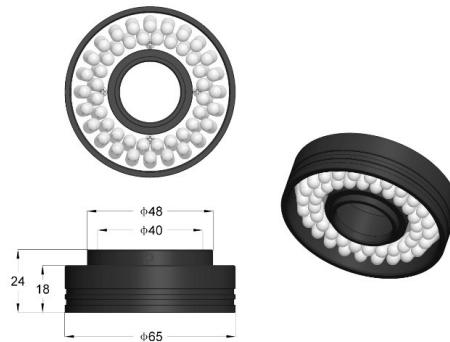


Figure 5-11 TzM0756DRL-65, the maximum diameter of LED reaches 65mm, and the diameter of 40mm in the center can be directly sleeved to the front end of the corresponding MZO to achieve uniform reflection lighting

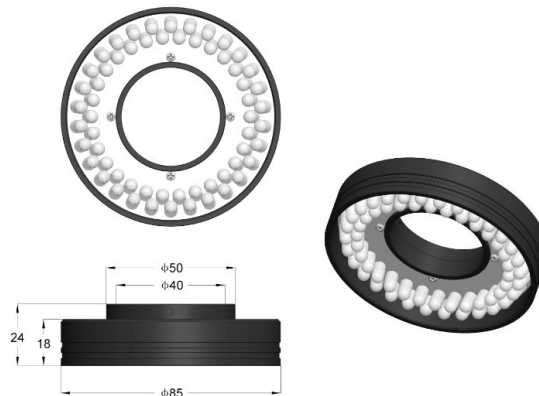


Figure 5-12 TzM0756DRL-85, the maximum diameter of LED reaches 85mm, and the diameter of 40mm in the center can be directly sleeved to the front end of the corresponding MZO to achieve uniform reflection lighting

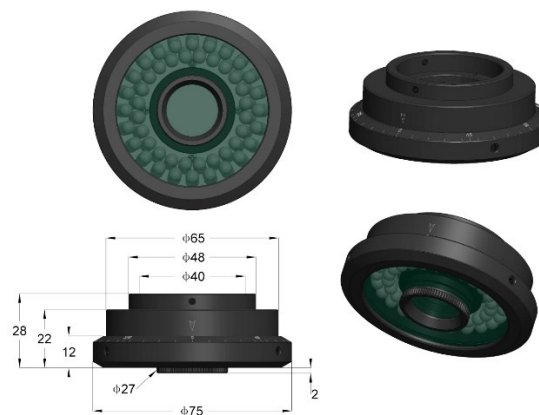


Figure 5-13 TzM0756DRPL-65, the maximum diameter of the LED reaches 65mm, and the small hole with a center diameter of 40mm can be directly sleeved on the front end of the corresponding MZO. By rotating the polarizing plate, uniform illumination of linear polarized light in different directions can be realized

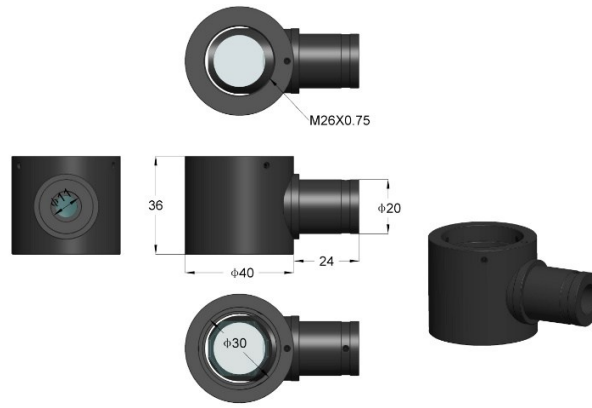


Figure 5-14 TZM0756CL Coaxial Light Adapter with 11mm hole for LED Spot Light

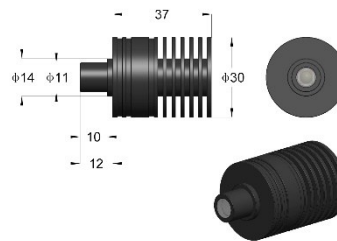


Figure 5-15 TZM0756SL, LED Spot Light can be directly connected with Coaxial Light adapter(TZM0756CL) to realize coaxial light illumination

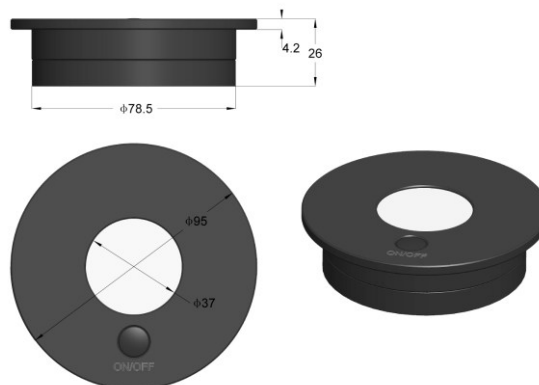


Figure 5-16 TZM0756TL LED Transmission Light source with illumination range of 37mm

5.3.2 TZM0756 Series Light Source Packing Information

The packing information of [TZM0756DRL-65/85](#) is as follows:



Figure 5-17 TZM0756DRL-65/85, including LED Direct Ring Light and Power Adapter

The packing information of [TZM0756DRPL-65](#) is as follows:



Figure 5-18 TZM0756DRPL-65, including LED Direct Ring Polarization Light and Power Adapter

The packing information of [Coaxial Light Module](#) is as follows:



Figure 5-19 TZM0756 Coaxial Light Module, including TZM0756CL (Coaxial Light Adapter), TZM0756SL (LED Spot Light) and Power Adapter

5.4 The Light Source for TZM0745B MZO

The light source is suitable for TZM0745B MZO.

5.4.1 TZM0745B Series Light Source Module

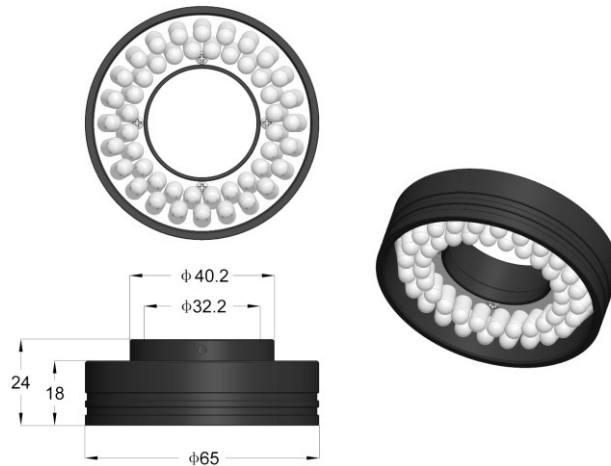


Figure 5-20 TZM0745BDRL-65 LED Direct Ring Light

5.4.2 The Packing Information of Light Source for TZM0745B MZO



Figure 5-21 TZM0745BDRL-65, including LED Direct Ring Light and Power Adapter

6 Continuous Zoom Objectives

6.1 TZM0756 MZO

6.1.1 The Configuration of TZM0756 MZO with Five Modules

TZM0756 MZO(Monocular Zoom Objective) is an ideal choice for most applications that requires multiple magnifications or for those that prohibits continual manual refocusing. The applications of the TZM0756 MZO are: machine vision; small details inspection; industrial inspection especially electronic components; scientific research; medical industry; education industry.

The modular design of TZM0756 MZO is showed in below. The design is based on the bilateral parallel light path principle and consists of five basic modules. The five basic modules are: Middle Zoom Module, Auxiliary Lens Module, TV Lens Module, Bracket Adapter Module and Optional Module(Not show in the figure).

TZM0756 MZO can be combined with Camera Module (optional) to form a digital monocular zoom microscope.

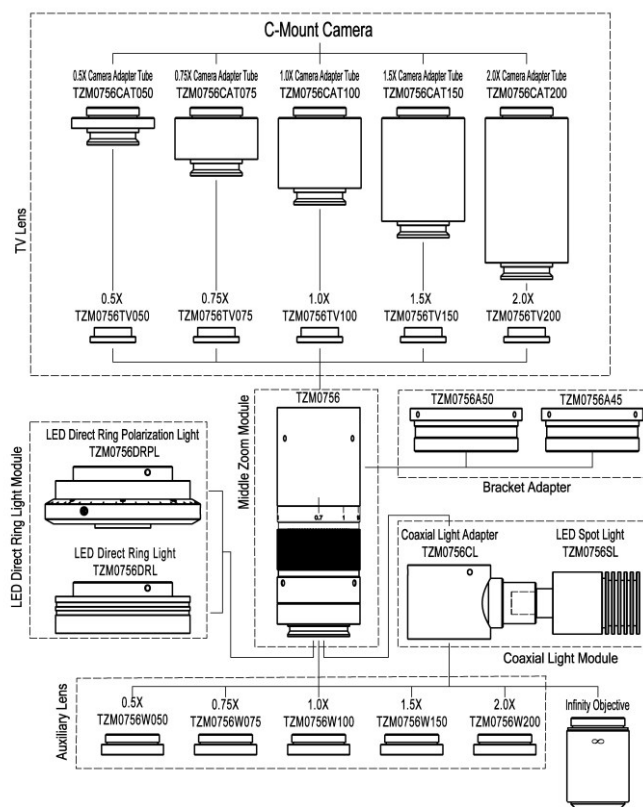


Figure 6-1 The five modules and the TZM0756 MZO

The basic module of TZM0756 MZO is TZM0756-W100-TV100-A50, it has 0.7X to 5.6X zoom range and 8X zoom ratio. It is a high-quality precision MZO that provides high resolution and large depth of field. Its main features are shown below:

- With 0.7X~5.6X zoom range
- Large optical zoom ratio: 8X
- Larger NA: 0.018-0.092 (When using 1x Auxiliary Lens)
- Higher resolution: 18.6um-3.65um (When using 1.00x Auxiliary Lens)
- Larger field of view: 1.00mm-34.28mm (Object plane)
- Larger sensor size: 2/3" (When using 1.00x TV Lens)
- Working distance range: 37.5mm-160mm
- Parfocal in zoom range
- Compatible with infinity objectives (both biological and metallographic)
- Compact size: 150 mm (length) × 40 mm (diameter)
- Auxiliary Lens with 0.50x, 0.75x, 1.00x, 1.50x and 2.00x magnification (Optional)
- TV Lens with 0.50x, 0.75x, 1.00x, 1.50x and 2.00x magnification (Optional)
- Brightness adjustable LED Direct Ring Light (Optional)
- Brightness adjustable LED Direct Ring Polarization Light (Optional)
- Brightness adjustable LED Coaxial Light (Optional)
- LED Transmissive Light (Optional)
- 45mm or 50mm Bracket Adapter (Optional)



Figure 6-2 The TZM0756 MZO with different configuration

6.1.2 TZM0756 MZO's Middle Zoom Module

Order Number	Meaning	TZM0756	Postfix meaning
TZM0756	Ordinary Middle Zoom Module	ZM: Zoom 0756: 0.7X~5.6X	NA
TZM0756T	Middle Zoom Module with back focus trimmable(adjustable) function		T: Trim
TZM0756D	Middle Zoom Module with detent to fix the magnification function		D: Detent
TZM0756TD	Middle Zoom Module with back focus trimmable and magnification detent functions		TD: Trim & Detent

6.1.3 TZM0756 MZO's Auxiliary Lens

Order number	Magnification	Working distance (mm)	Field of View in the object side(TV050, 1/3"sensor)	
			Lower magnification	Higher magnification
W050	0.5X	160	34.28mm	4.28mm
W075	0.75X	105	20.81mm	2.86mm
W100	1.00X	80	17.14mm	2.14mm
W150	1.50X	51.5	11.43mm	1.43mm
W200	2.00X	37.5	8.57mm	1.07mm

Note: The same **Auxiliary Lens** with different **TV lens** is just used to adapt to different size image sensor, which will not have much impact on the field of view of the **MZO**.

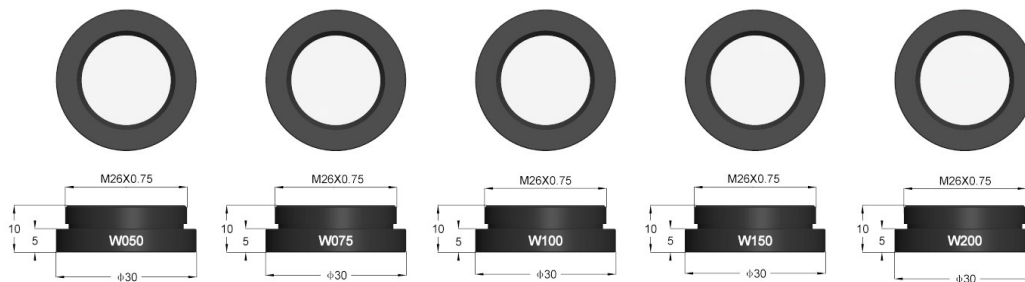


Figure 6-3 The Auxiliary Lens for TZM0756 MZO

6.1.4 TZM0756 MZO's TV Lens

Order number	The maximum compatible sensor size
TV050	1/3"
TV075	1/1.8"
TV100	2/3"
TV150	1"
TV200	4/3"

Note: Smaller image sensors can also be used for **TV Lens** with higher magnification, but in this way, the **FOV** of **MZO** will be reduced.

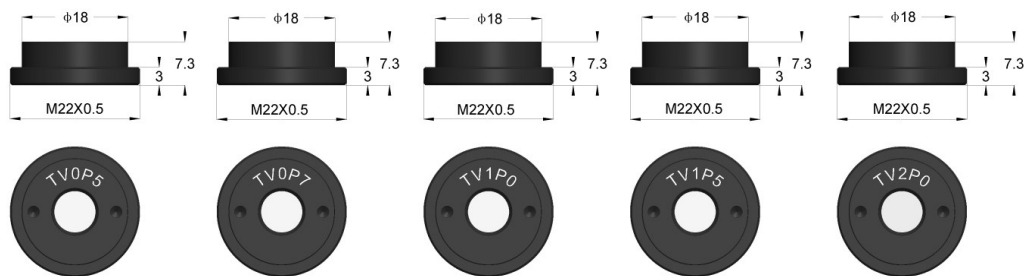


Figure 6-4 TV Lens with different magnification for TZM0756

6.1.5 TZM0756 MZO's Bracket Adapter

The installation method of the [Bracket Adapter](#) (TZM0756A45, TZM0756A50) and bracket is shown below.

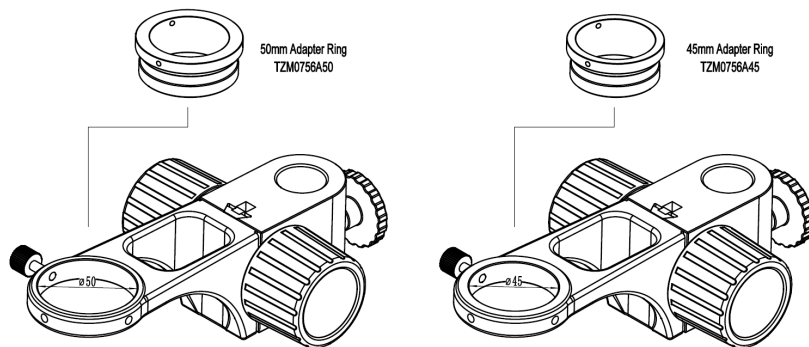


Figure 6-5 TZM0756 MZO's Bracket Adapter

6.1.6 TZM0756 MZO's Optional Module

The [Optional Modules](#) include [LED Direct Ring Light Module](#) (including [LED Direct Ring Light Module](#) and [LED Direct Ring Polarization Light Module](#)), [Coaxial Light Module](#) (composed of [Coaxial Light Adapter](#) and [LED Spot Light](#)) and [Transmissive Light Module](#). The currently possible samples are shown in table below.

Module	Order Number	Description
LED Direct Ring Light Module	TZM0756DRL-65, TZM0756DRL-85	LED Direct Ring Light
	TZM0756DRPL-65	LED Direct Ring Polarization Light
Coaxial Light Module	TZM0756CL+TZM0756SL	Coaxial Light Adapter + LED Spot Light
Transmissive Light Module	TZM0756TL	LED Transmissive Light
Power of Light Source	40600014	US:POWER-U-12V1A(Power Adapter American Standard)
	40600015	DE: POWER-E-12V1A(Power Adapter European standard)

6.1.7 The Optical Specifications of TZM0756 MZO with Different Auxiliary &TV Lens

The optical specifications of [TZM0756 MZO](#) with different [Auxiliary Lens](#) and [TV Lens](#) are shown in table below. [Auxiliary Lens](#) and [TV Lens](#) with 1.00x([TZM0756-W100-TV100](#)) are listed in the left-up cell. Its data is the basis of the other parameters in the whole table.

Auxiliary Lens	Specifications	TV Lens									
		1.0X(2/3") TV100		0.5X(1/3") TV050		0.75X(1/1.8") TV075		1.5X(1") TV150		2.0X(4/3") TV200	
		Lower	Higher	Lower	Higher	Lower	Higher	Lower	Higher	Lower	Higher
1.0X (80mm WD) WD100	PMAG	0.70X-5.60X		0.35X-2.80X		0.525X-4.20X		1.05X-8.40X		1.40X-11.20X	
	DFOV(mm)	15.71	1.96	17.14	2.14	17.02	2.13	15.24	1.9	16.07	2.01
	NAO	0.018	0.092	0.018	0.092	0.018	0.092	0.018	0.092	0.018	0.092
0.5X (160mm WD) WD050	PMAG	0.35X-2.80X		0.18X-1.40X		0.263X-2.10X		0.525X-4.20X		0.70X-5.60X	
	DFOV(mm)	31.43	3.93	34.28	4.28	33.97	4.25	30.48	3.81	32.14	4.02
	NAO	0.009	0.046	0.009	0.046	0.009	0.046	0.009	0.046	0.009	0.046
0.75X (105mm WD) WD075	PMAG	0.53X-4.20X		0.263X-2.10X		0.394X-3.15X		0.79X-6.30X		1.05X-8.40X	
	DFOV(mm)	20.99	2.61	20.81	2.86	22.67	2.84	20.25	2.54	21.43	2.68

	NAO	0.013	0.069	0.013	0.069	0.013	0.069	0.013	0.069	0.013	0.069
1.5X (51.5mm WD)WD150	PMAG	1.05X-8.40X		0.525X-4.20X		0.788X-6.30X		1.58X-12.60X		2.10X-16.80X	
	DFOV(mm)	10.46	1.31	11.43	1.43	11.34	1.42	10.13	1.27	10.71	1.34
	NAO	0.026	0.138	0.026	0.138	0.026	0.138	0.026	0.138	0.026	0.138
2.0X (37.5mm WD)WD200	PMAG	1.40X-11.20X		0.70X-5.60X		1.05X-8.40X		2.10X-16.80X		2.80X-22.40X	
	DFOV(mm)	7.9	1	8.57	1.07	8.51	1.06	7.62	0.95	8.04	1
	NA	0.035	0.182	0.035	0.182	0.035	0.182	0.035	0.182	0.035	0.182
Remarks	When using coaxial lighting, low magnification may produce vignetting. When using infinity objectives as Auxiliary Lens Module (adapter available), the PMAG、FOV and NAO of the TZM0756 depends on the parameters of the objectives.										

WD: Working Distance; **PMAG:** Primary Magnification; **DFOV:** Diagonal Field of View in the object side; **NA:** Numerical Aperture;

Note: Infinity corrected objectives limit system's usable zoom range due to uneven illumination. The maximum sensor size is 2/3".

6.1.8 The Dimension of TZM0756 MZO with Different Light Module

The dimension of **TZM0756-W100-TV100-A50** with different light a) **TZM0756** without light module; b) **TZM0756** equipped with **Direct Ring Light Module**; c) **TZM0756** equipped with **Coaxial Light Module** are showed below.

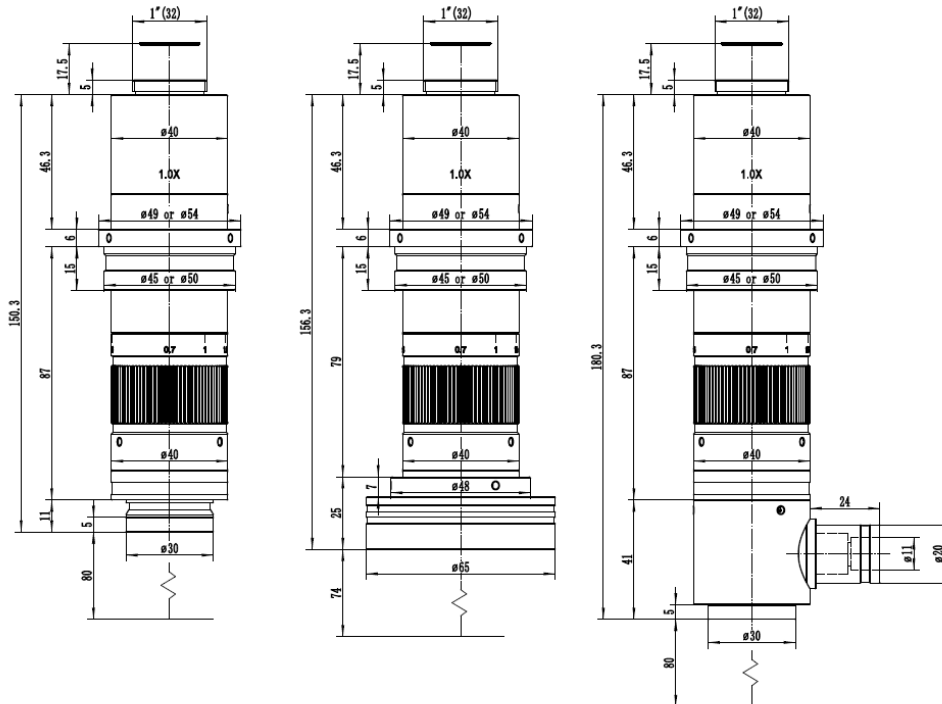


Figure 6-6 Dimensions of TZM0756-W100-TV100-A50 with different light module
a) TZM0756-W100-TV100-A50 without light module;
b) TZM0756-W100-TV100-A50 equipped with Direct Ring Light,
c) TZM0756-W100-TV100-A50 equipped with Coaxial Light)

The length of the **MZO** with different **TV Lens** will be slightly different. The length of **TZM0756-W100-TV100-A50** is 150.3mm, it is much shorter than most of the MZO in the market.

6.1.9 How to Configure TZM0756 MZO

The corresponding parameters of **TZM0756** MZO are listed in below. A specific combination can be determined according to the following steps.

1. Confirm the possible range of 1) **DFOV** and 2) **Working Distance** in the object space to choose the **Auxiliary Lens**.
2. Choose the M26x0.705 to M20x0.705 **Objective Adapter**, if the M20x0.705 mount infinity objective is used.
3. Confirm the camera **Image Area Size**, it can be 1) **Sensor Size** (1/x in inch), 2) **Image Diagonal Length**, 3) **Image Width** or 4) **Image Height** to choose the right **TV Lens**.
4. Choose the 45mm or 50 mm **Bracket Adapter** according to the diameter of the bracket hole diameter .
5. Choose the **LED Direct Ring Light Module** for the reflective illumination.
6. Choose the **Coaxial Light Module** if coaxial illumination is required.
7. Choose the **Transmissive Light Module** if transmissive illumination is required.
8. Choose the **Camera Module**.

We offer a variety of microscope cameras. Customers could get the detailed information of our cameras on the official website (<http://www.touptek.com/>) and choose the appropriate ones.

The combinations of different the Auxiliary Lens, The Middle Zoom Module and the TV Lens. With this figure, user can configure MZO with different magnification to fit different sensor and different application

Camera	Auxiliary Lens-Main Zoom Module-TV Lens	WD(mm)	PMAG	DFOV(mm)	NAO
1/3 “	TZM0756-W050-TV050	160	0.18X-1.40X	34.28-4.28	0.009-0.046
	TZM0756-W075-TV050	105	0.26X-2.10X	20.81-2.86	0.013-0.069
	TZM0756-W100-TV050	80	0.35X-2.80X	17.14-2.14	0.018-0.092
	TZM0756-W150-TV050	52	0.53X-4.20X	11.43-1.43	0.026-0.138
	TZM0756-W200-TV050	38	0.70X-5.60X	8.57-1.07	0.035-0.182
1/1.8”	TZM0756-W050-TV075	160	0.26X-2.10X	33.97-4.25	0.009-0.046
	TZM0756-W075-TV075	105	0.40X-3.15X	22.67-2.84	0.013-0.069
	TZM0756-W100-TV075	80	0.53X-4.20X	17.02-2.13	0.018-0.092
	TZM0756-W150-TV075	52	0.79X-6.30X	11.34-1.42	0.026-0.138
	TZM0756-W200-TV075	38	1.05X-8.40X	8.51-1.06	0.035-0.182
2/3 “	TZM0756-W050-TV100	160	0.35X-2.80X	31.74-3.93	0.009-0.046
	TZM0756-W075-TV100	105	0.53X-4.20X	20.99-2.61	0.013-0.069
	TZM0756-W100-TV100	80	0.70X-5.60X	15.80-1.96	0.018-0.092
	TZM0756-W150-TV100	52	1.05X-8.40X	10.46-1.31	0.026-0.138
	TZM0756-W200-TV100	38	1.40X-11.2X	7.90-0.99	0.035-0.182
1”	TZM0756-W050-TV150	160	0.53X-4.20X	30.48-3.81	0.009-0.046
	TZM0756-W075-TV150	105	0.79X-6.30X	20.25-2.54	0.013-0.069
	TZM0756-W100-TV150	80	1.05X-8.40X	15.24-1.90	0.018-0.092
	TZM0756-W150-TV150	52	1.58X-12.6X	10.13-1.27	0.026-0.138
	TZM0756-W200-TV150	38	2.10X-16.8X	7.62-0.95	0.035-0.182
4/3 “	TZM0756-W050-TV200	160	0.70X-5.60X	32.14-4.02	0.009-0.046
	TZM0756-W075-TV200	105	1.05X-8.40X	21.43-2.68	0.013-0.069
	TZM0756-W100-TV200	80	1.40X-11.2X	16.07-2.01	0.018-0.092
	TZM0756-W150-TV200	52	2.10X-16.8X	10.71-1.34	0.026-0.138
	TZM0756-W200-TV200	38	2.80X-22.4X	8.04-1.00	0.035-0.182

6.1.10 TZM0756 MZO's Packing List

The packing information of the [TZM0756 MZO](#) is as follows:



Figure 6-7 The TZM0756 main body, including Auxiliary Lens Module, Middle Zoom Module, TV Lens, Camera Adapter Tube and Bracket Adapter

6.1.11 Order List of TZM0756 MZO

6.1.11.1 TZM0756 Function Module Optional Order List

Module	Order number	Quantity	Remarks	Description
Middle Zoom Module	TZM0756			Ordinary Middle Zoom Module
	TZM0756T			Middle Zoom Module with adjustable back focus
	TZM0756D			Middle Zoom Module with detent
	TZM0756TD			Middle Zoom Module with adjustable back focus and detent

Auxiliary Lens Module	W050			0.50X Object Lens
	W075			0.75X Object Lens
	W100			1.0X Object Lens
	W150			1.5X Object Lens
	W200			2.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV050			For 1/3" Sensor
	TV075			For 1/1.8" Sensor
	TV100			For 2/3" Sensor
	TV150			For 1" Sensor
	TV200			For 4/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL-65			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(American Standard)
	40600015			POWER-E-12V1A(European standard)

6.1.11.2 TZM0756 Monocular Zoom Object Package Order List

Order number		Quantity	Remarks
Package Name	TZM0756□ □-W□□□□-TV□□□□-A□□		
	TZM0756□ □-W□□□□-TV□□□□-A□□		
	TZM0756□ □-W□□□□-TV□□□□-A□□		
	TZM0756□ □-W□□□□-TV□□□□-A□□		
	TZM0756□ □-W□□□□-TV□□□□-A□□		
	TZM0756□ □-W□□□□-TV□□□□-A□□		
	TZM0756□ □-W□□□□-TV□□□□-A□□		
	TZM0756□ □-W□□□□-TV□□□□-A□□		
	TZM0756□ □-W□□□□-TV□□□□-A□□		
Remarks			
Remarks: Users or salesmen can directly write the corresponding module name, number of sets, and other special requirements in the remarks with their own professional knowledge.			

6.1.11.3 TZM0756 Order List of Other Accessories

Module	Order number	Quantity	Remarks	Description
Auxiliary Lens Module	W050			0.50X Object Lens
	W075			0.75X Object Lens
	W100			1.0X Object Lens
	W150			1.5X Object Lens
	W200			2.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV050			For 1/3" Sensor
	TV075			For 1/1.8" Sensor
	TV100			For 2/3" Sensor
	TV150			For 1" Sensor
	TV200			For 4/3" Sensor

The Light Source for TzM0756 MZO

Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL-65			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(MSA-C1000IC12.0-12H-US), Power Adapter American Standard
	40600015			POWER-E-12V1A(MSA-C10001C12.0-12W-DE), Power Adapter European standard

6.2 TZM0745A MZO

6.2.1 The Configuration of TZM0745A MZO with Five Modules

TZM0745A MZO(Monocular Zoom Objective) is an ideal choice for most applications that requires multiple magnifications or for those that prohibits continual manual refocusing. The applications of the **TZM0745A MZO** are: machine vision; small details inspection; industrial inspection especially electronic components; scientific research; medical industry; education industry.

The modular design of **TZM0745A MZO** is shown in below. The design is based on the bilateral parallel light path principle and consists of five basic modules. The five basic modules are: **Middle Zoom Module**, **Auxiliary Lens Module**, **TV Lens Module**, **Bracket Adapter Module** and **Optional Module**(Not show in the figure).

TZM0745A MZO can be combined with **Camera Module** (optional) to form a digital monocular zoom microscope.

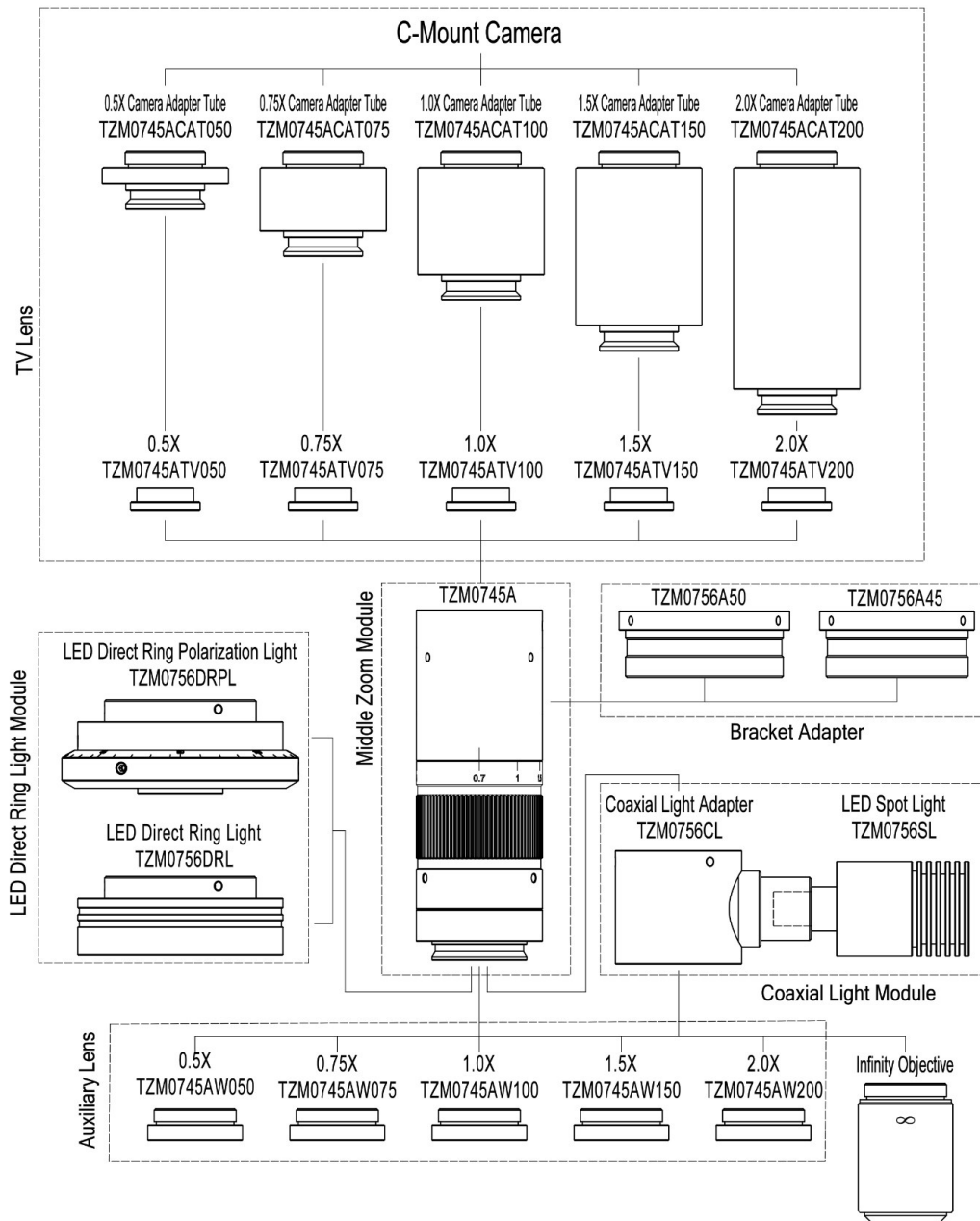


Figure 6-8 The five modules and the TZM0745A MZO

The basic module of **TZM0745A MZO** is **TZM0745A-W100-TV100-A50**, it has 0.7X to 4.5X zoom range and 6.5X zoom ratio. It is a high-quality precision **MZO** that provides high resolution and large depth of field. Its main features are shown below:

- With 0.7X~4.5X zoom range
- Large optical zoom ratio: 6.5X
- Larger NA: 0.018-0.078 (When using 1x **Auxiliary Lens**)
- Higher resolution: 18.6um-4.3um (When using 1.00x **Auxiliary Lens**)

- Larger field of view: 1.25mm-34.28mm (Object plane)
- Larger sensor size: 2/3" (When using 1.00x TV Lens)
- Working distance range: 37.5mm-160mm
- Parfocal in zoom range
- Compatible with infinity objectives (both biological and metallographic)
- Compact size: 150 mm (length) × 40 mm (diameter)
- Auxiliary Lens with 0.50x, 0.75x, 1.00x, 1.50x and 2.00x magnification (Optional)
- TV Lens with 0.50x, 0.75x, 1.00x, 1.50x and 2.00x magnification (Optional)
- Brightness adjustable LED Direct Ring Light (Optional)
- Brightness adjustable LED Direct Ring Polarization Light (Optional)
- Brightness adjustable LED Coaxial Light (Optional)
- LED Transmissive Light (Optional)
- 45mm or 50mm Bracket Adapter (Optional)



Figure 6-9 The TZM0745A MZO with different configuration

6.2.2 TZM0745A MZO's Middle Zoom Module

Order Number	Meaning	TZM0745A	Postfix meaning
TZM0745A	Ordinary Middle Zoom Module	ZM: Zoom 0745: 0.7X~4.5X	NA
TZM0745AT	Middle Zoom Module with back focus trimmable(adjustable) function		T: Trim
TZM0745AD	Middle Zoom Module with detent to fix the magnification function		D: Detent
TZM0745ATD	Middle Zoom Module with back focus trimmable and magnification detent functions		TD: Trim & Detent

6.2.3 TZM0745A MZO's Auxiliary Lens

Order number	Magnification	Working distance (mm)	Field of View in the object side(TV050, 1/3"sensor)	
			Lower magnification	Higher magnification
W050	0.5X	160	34.28mm	4.28mm
W075	0.75X	105	20.81mm	2.86mm
W100	1.00X	80	17.14mm	2.14mm
W150	1.50X	51.5	11.43mm	1.43mm
W200	2.00X	37.5	8.57mm	1.07mm

Note: The same Auxiliary Lens with different TV lens is just used to adapt to different size image sensor, which will not have much impact on the field of view of the MZO.

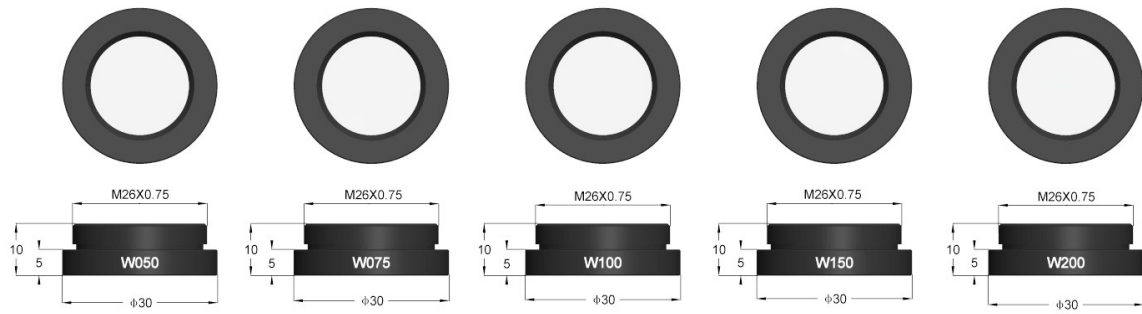


Figure 6-10 The Auxiliary Lens for TZM0745A MZO

6.2.4 TZM0745A MZO's TV Lens

Order number	The maximum compatible sensor size
TV050	1/3"
TV075	1/1.8"
TV100	2/3"
TV150	1"
TV200	4/3"

Note: Smaller image sensors can also be used for TV Lens with higher magnification, but in this way, the DFOV of MZO will be reduced.

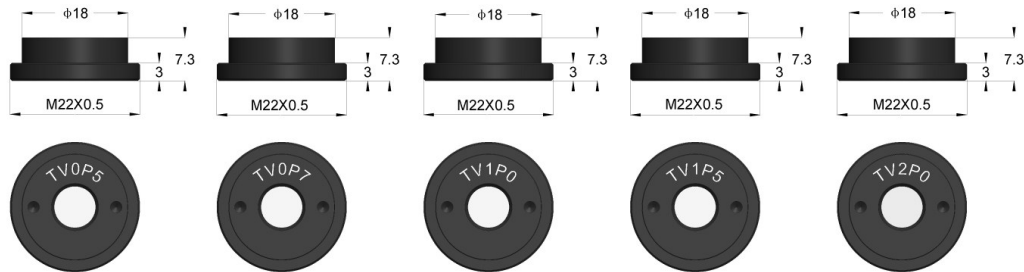


Figure 6-11 TV Lens with different magnification for TZM0745A

6.2.5 TZM0745A MZO's Bracket Adapter

The installation method of the Bracket Adapter (TZM0756A45, TZM0756A50) and bracket is shown below:

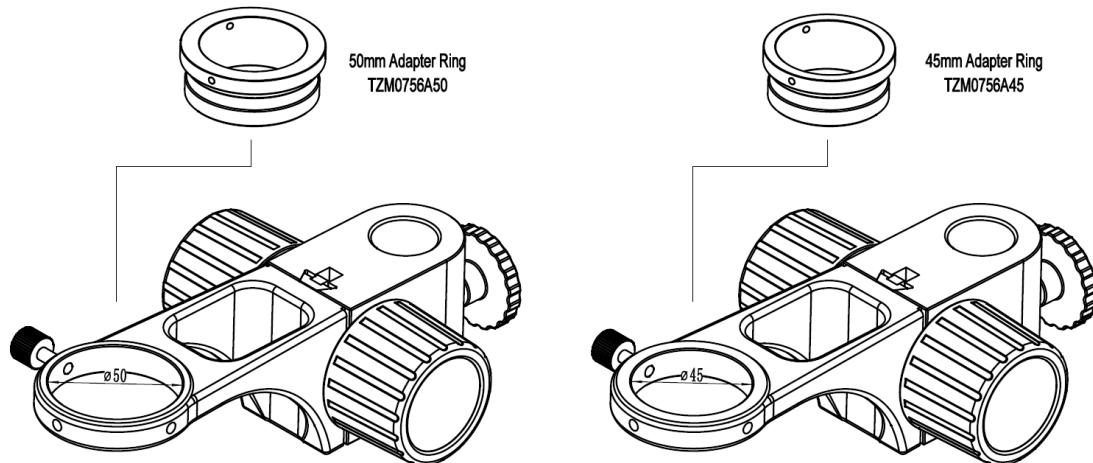


Figure 6-12 TZM0745A MZO's Bracket Adapter

6.2.6 TZM0745A MZO's The Optional Module

The Optional Modules include LED Direct Ring Light Module (including LED Direct Ring Light Module and LED Direct Ring Polarization Light Module), Coaxial Light Module (composed of Coaxial Light Adapter and LED Spot Light) and Transmissive Light Module. The currently possible samples are shown in table below.

Module	Order Number	Description
LED Direct Ring Light Module	TZM0756DRL-65, TZM0756DRL-85	LED Direct Ring Light

	TZM0756DRPL-65	LED Direct Ring Polarization Light
Coaxial Light Module	TZM0756CL+TZM0756SL	Coaxial Light Adapter + LED Spot Light
Transmissive Light Module	TZM0756TL	LED Transmissive Light
Power of Light Source	40600014	US:POWER-U-12V1A(Power Adapter American Standard)
	40600015	DE: POWER-E-12V1A(Power Adapter European standard)

6.2.7 The Optical Specifications of TZM0745A MZO with Different Auxiliary &TV Lens

The optical specifications of **TZM0745A MZO** with different **Auxiliary Lens** and **TV Lens** are shown in table below. **Auxiliary Lens** and **TV Lens** with 1.00x (**TZM0745A-W100-TV100**) are listed in the left-up cell. Its data is the basis of the other parameters in the whole table.

Auxiliary Lens	Specifications	TV Lens									
		1.0X(2/3") TV100		0.5X(1/3") TV050		0.75X(1/2") TV075		1.5X(1") TV150		2.0X(4/3") TV200	
		Lower	Higher	Lower	Higher	Lower	Higher	Lower	Higher	Lower	Higher
1.0X (80mm WD) WD100	PMAG	0.70X-4.5X		0.35X-2.25X		0.525X-3.38X		1.05X-6.75X		1.40X-9.00X	
	DFOV(mm)	15.71	2.44	17.14	2.67	15.24	2.37	15.24	2.37	16.07	2.5
	NAO	0.018	0.078	0.018	0.078	0.018	0.078	0.018	0.078	0.018	0.078
0.5X (160mm WD) WD050	PMAG	0.35X-2.25X		0.18X-1.13X		0.263X-1.69X		0.525X-3.38X		0.70X-4.50X	
	DFOV(mm)	31.43	4.89	34.28	5.33	30.48	4.74	30.48	4.74	32.14	5
	NAO	0.009	0.039	0.009	0.039	0.009	0.039	0.009	0.039	0.009	0.039
0.75X (105mm WD) WD075	PMAG	0.53X-3.38X		0.263X-1.69X		0.394X-2.53X		0.79X-5.06X		1.05X-6.75X	
	DFOV(mm)	20.99	3.26	20.81	3.56	20.32	3.16	20.32	3.16	21.43	3.33
	NAO	0.013	0.059	0.013	0.059	0.013	0.059	0.013	0.059	0.013	0.059
1.5X (51.5mm WD) WD150	PMAG	1.05X-6.75X		0.525X-3.38X		0.788X-5.06X		1.58X-10.13X		2.10X-13.50X	
	DFOV(mm)	10.46	1.63	11.43	1.78	10.16	1.58	10.16	1.58	10.71	1.67
	NAO	0.026	0.117	0.026	0.117	0.026	0.117	0.026	0.117	0.026	0.117
2.0X (37.5mm WD) WD200	PMAG	1.40X-9.00X		0.70X-4.5X		1.05X-6.75X		2.10X-13.50X		2.80X-18.00X	
	DFOV(mm)	7.9	1.22	8.57	1.33	7.62	1.19	7.62	1.19	8.04	1.25
	NAO	0.035	0.155	0.035	0.182	0.035	0.155	0.035	0.155	0.035	0.155
Remarks	When using infinity objectives as Auxiliary Lens Module (adapter available), the PMAG、FOV and NA of the TZM0745A depends on the parameters of the objectives.										

WD: Working Distance; **PMAG:** Primary Magnification; **DFOV:** Field of View in the object side; **NA:** Numerical Aperture;
Note: Infinity corrected objectives limit system's usable zoom range due to uneven illumination. The maximum sensor size is 2/3".

6.2.8 The Dimension of TZM0745A MZO with Different Light Module

The dimensions of **TZM0745A-W100-TV100-A50** with different light a) **TZM0745A** without light module; b) **TZM0745A** equipped with **Direct Ring Light Module**; c) **TZM0745A** equipped with **Coaxial Light Module** are showed below.

The length of the **MZO** with different **TV Lens** will be slightly different. The length of **TZM0745A-W100-TV100-A50** is 150.3mm, it is much shorter than most of the MZO in the market.

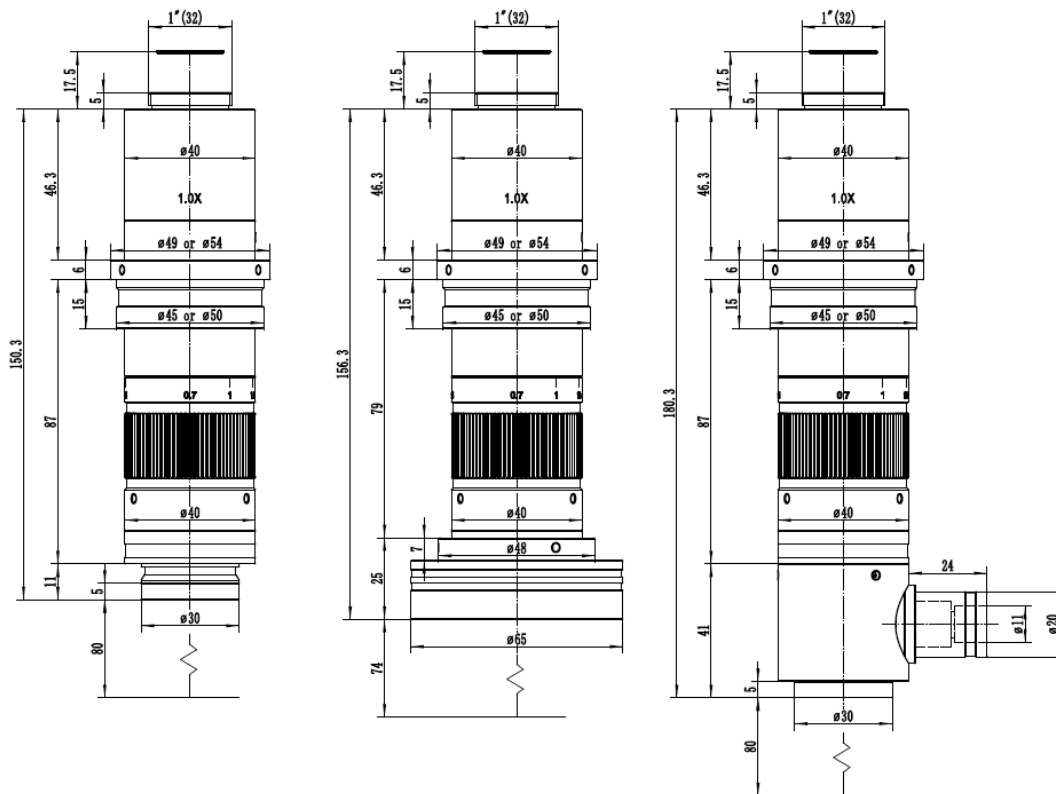


Figure 6-13 Dimensions of TZM0745A-W100-TV100-A50 with different light module

- TZM0745A-W100-TV100-A50 without light module;
- TZM0745A-W100-TV100-A50 equipped with Direct Ring Light Module;
- TZM0745A-W100-TV100-A50 equipped with Coaxial Light Module.

6.2.9 How to Configure TZM0745A MZO

The corresponding parameters of TZM0745A MZO are listed below. A specific combination can be determined according to the following steps.

- Confirm the possible range of 1) **DFOV** and 2) **Working Distance** in the object space to choose the **Auxiliary Lens**.
- Choose the M26x0.705 to M20x0.705 **Objective Adapter**, if the M20x0.705 mount infinity objective is used.
- Confirm the camera **Image Area Size**, it can be 1) **Sensor Size** (1/x in inch), 2) **Image Diagonal Length**, 3) **Image Width** or 4) **Image Height** to choose the right TV Lens.
- Choose the 45mm or 50 mm **Bracket Adapter** according to the diameter of the bracket hole diameter .
- Choose the **LED Direct Ring Light Module** for the reflective illumination.
- Choose the **Coaxial Light Module** if coaxial illumination is required.
- Choose the **Transmissive Light Module** if transmissive illumination is required.
- Choose the **Camera Module**.

We offer a variety of microscope cameras.

Customers could get the detailed information of our cameras on the official website (<http://www.touptek.com/>) and choose the appropriate ones.

The combinations of different the **Auxiliary Lens**, The **Middle Zoom Module** and the **TV Lens**. With this figure, user can configure **MZO** with different magnification to fit different sensor and different application

Camera	Auxiliary Lens-Main Zoom Module-TV Lens	WD(mm)	PMAG	DFOV(mm)	NAO
1/3 "	TZM0745A-W050-TV050	160	0.18X-1.13X	34.28-5.33	0.009-0.039
	TZM0745A-W075-TV050	105	0.26X-1.69X	22.86-3.56	0.013-0.059
	TZM0745A-W100-TV050	80	0.35X-2.25X	17.14-2.67	0.018-0.078
	TZM0745A-W150-TV050	52	0.53X-3.38X	11.43-1.78	0.026-0.117
	TZM0745A-W200-TV050	38	0.70X-4.50X	8.57-1.33	0.035-0.155
1/1.8"	TZM0745A-W050-TV075	160	0.26X-1.69X	30.48-4.74	0.009-0.039
	TZM0745A-W075-TV075	105	0.40X-2.53X	20.32-3.16	0.013-0.059
	TZM0745A-W100-TV075	80	0.53X-3.38X	15.24-2.37	0.018-0.078
	TZM0745A-W150-TV075	52	0.79X-5.06X	10.16-1.58	0.026-0.117
	TZM0745A-W200-TV075	38	1.05X-6.75X	7.62-1.19	0.035-0.155

2/3 “	TZM0745A-W050-TV100	160	0.35X-2.25X	31.43-4.89	0.009-0.039
	TZM0745A-W075-TV100	105	0.53X-3.38X	20.95-3.26	0.013-0.059
	TZM0745A-W100-TV100	80	0.70X-4.5X	15.71-2.44	0.018-0.078
	TZM0745A-W150-TV100	52	1.05X-6.75X	10.46-1.63	0.026-0.117
	TZM0745A-W200-TV100	38	1.40X-9.00X	7.90-1.22	0.035-0.155
1”	TZM0745A-W050-TV150	160	0.53X-3.38X	30.48-4.74	0.009-0.039
	TZM0745A-W075-TV150	105	0.79X-5.06X	20.25-3.16	0.013-0.059
	TZM0745A-W100-TV150	80	1.05X-6.75X	15.24-2.37	0.018-0.078
	TZM0745A-W150-TV150	52	1.58X-10.13X	10.13-1.58	0.026-0.117
	TZM0745A-W200-TV150	38	2.10X-13.5X	7.62-1.19	0.035-0.155
4/3 “	TZM0745A-W050-TV200	160	0.70X-4.50X	32.14-5.00	0.009-0.039
	TZM0745A-W075-TV200	105	1.05X-6.75X	21.43-3.33	0.013-0.059
	TZM0745A-W100-TV200	80	1.40X-9.00X	16.07-2.50	0.018-0.078
	TZM0745A-W150-TV200	52	2.10X-13.5X	10.71-1.67	0.026-0.117
	TZM0745A-W200-TV200	38	2.80X-18.00X	8.04-1.25	0.035-0.155

6.2.10 TZM0745A MZO Packing List

The packing information of the [TZM0745A MZO](#) is as follows:



Figure 6-14 The TZM0745A Main Body, including Auxiliary Lens Module, Middle Zoom Module, TV Lens, Camera Adapter Tube and Bracket Adapter

6.2.11 Order List of TZM0745A MZO

6.2.11.1 TZM0745A Function Module Optional Order List

Module	Order number	Quantity	Remarks	Description
Middle Zoom Module	TZM0745A			Ordinary Middle Zoom Module
	TZM0745AT			Middle Zoom Module with adjustable back focus
	TZM0745AD			Middle Zoom Module with detent
	TZM0745ATD			Middle Zoom Module with adjustable back focus and detent
Auxiliary Lens Module	W050			0.50X Object Lens
	W075			0.75X Object Lens
	W100			1.0X Object Lens
	W150			1.5X Object Lens
	W200			2.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV050			For 1/3" Sensor
	TV075			For 1/1.8" Sensor
	TV100			For 2/3" Sensor

	TV150			For 1" Sensor
	TV200			For 4/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65/85			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL-65			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(American Standard)
	40600015			POWER-E-12V1A(European standard)

6.2.11.2 TZM0745A Monocular Zoom Object Package Order List

Order number		Quantity	Remarks
Package Name	TZM0745A□ □-W□□□-TV□□□-A□□		
	TZM0745A□ □-W□□□-TV□□□-A□□		
	TZM0745A□ □-W□□□-TV□□□-A□□		
	TZM0745A□ □-W□□□-TV□□□-A□□		
	TZM0745A□ □-W□□□-TV□□□-A□□		
	TZM0745A□ □-W□□□-TV□□□-A□□		
	TZM0745A□ □-W□□□-TV□□□-A□□		
	TZM0745A□ □-W□□□-TV□□□-A□□		
	TZM0745A□ □-W□□□-TV□□□-A□□		
Remarks			
Remarks: Users or salesmen can directly write the corresponding module name, number of sets, and other special requirements in the remarks with their own professional knowledge.			

6.2.11.3 TZM0745A Order List of Other Accessories

Module	Order number	Quantity	Remarks	Description
Auxiliary Lens Module	W050			0.50X Object Lens
	W075			0.75X Object Lens
	W100			1.0X Object Lens
	W150			1.5X Object Lens
	W200			2.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV050			For 1/3" Sensor
	TV075			For 1/1.8" Sensor
	TV100			For 2/3" Sensor
	TV150			For 1" Sensor
	TV200			For 4/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65/85			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL-65			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(MSA-C1000IC12.0-12H-US), Power Adapter American Standard
	40600015			POWER-E-12V1A(MSA-C1000IC12.0-12W-DE), Power Adapter European standard

6.3 TZM0745B MZO

6.3.1 The Configuration of TZM0745B MZO with Five Modules

TZM0745B MZO(Monocular Zoom Objective) is an ideal choice for most applications that requires multiple magnifications or for those that prohibits continual manual refocusing. The applications of the **TZM0745B MZO** are: machine vision; small details inspection; industrial inspection especially electronic components; scientific research; medical industry; education industry.

The modular design of **TZM0745B MZO** is shown below. The design is based on the bilateral parallel light path principle and consists of five basic modules. The three basic modules are: **Middle Zoom Module** with preconfigured **Auxiliary Lens**, **TV Lens**, **Bracket Adapter Module** and **Optional Module**(Not show in the figure).

TZM0745B MZO can be combined with **Camera Module** (optional) to form a digital monocular zoom microscope.

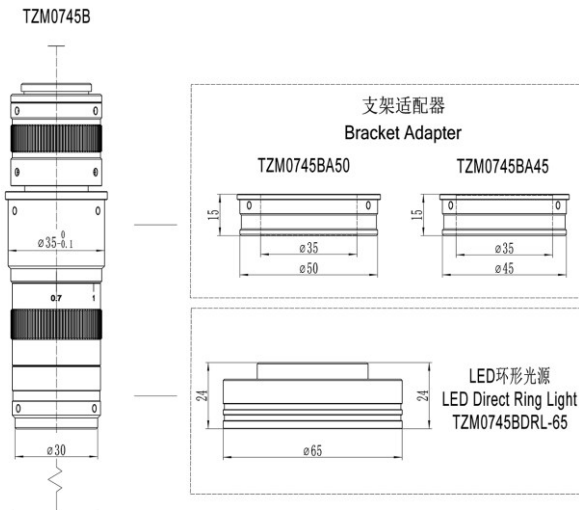


Figure 6-15 The three modules and the TZM0745B MZO

The basic module of **TZM0745B MZO** is **TZM0745B-W2100-TV2050-A50**. Its main features are shown below:

- With 0.7X~4.5X zoom range, 6.5X zoom ratio
- Larger NA: 0.02-0.07 (When using 1x **Auxiliary Lens**)
- Higher resolution: 17um-3.9um (When using 1.00x **Auxiliary Lens**)
- Larger field of view: 2.67mm-22.85mm (**Object plane**)
- Larger sensor size: 1/1.8" (When using 0.75x **TV Lens**)
- Working distance range: 95mm-127mm
- Compact size: 125 mm (length) × 38mm (diameter)
- Parfocal in zoom range
- Intensity adjustable **LED Direct Ring Light** (Optional)
- **LED Transmissive Light** (Optional)



Figure 6-16 The TZM0745B MZO with different configuration

6.3.2 TZM0745B MZO's Middle Zoom Module with Preconfigured Auxiliary Lens, TV Lens

Order Number	Magnification of main body		Magnification of system	NA	Working distance	DFOV (mm)	The maximum compatible sensor size
--------------	----------------------------	--	-------------------------	----	------------------	-----------	------------------------------------

TZM0745B-W2100-TV2050	0.7X-4.5X		0.35X-2.25X	0.016-0.07	95mm	17.14-2.67	1/3inch
TZM0745B-W2100-TV2075	0.7X-4.5X		0.53X-3.38X	0.016-0.07	95mm	17.14-2.67	1/1.8inch
TZM0745B-W2075-TV2050	0.7X-4.5X		0.26X-1.69X	0.012-0.053	127mm	22.86-3.56	1/3inch
TZM0745B-W2075-TV2075	0.7X-4.5X		0.39X-2.53X	0.012-0.053	127mm	22.86-3.56	1/1.8inch

6.3.3 TZM0745B MZO's Auxiliary Lens

Order number	Magnification	Working distance (mm)	Field of View in the object side(TV2050, 1/3"sensor)	
			Lower magnification	Higher magnification
W2075	0.75X	127	22.86mm	3.56mm
W2100	1.00X	95	17.14mm	2.67mm

Note: The same [Auxiliary Lens](#) with different [TV lens](#) is just used to adapt to different size image sensor, which will not have much impact on the field of view of the [MZO](#).

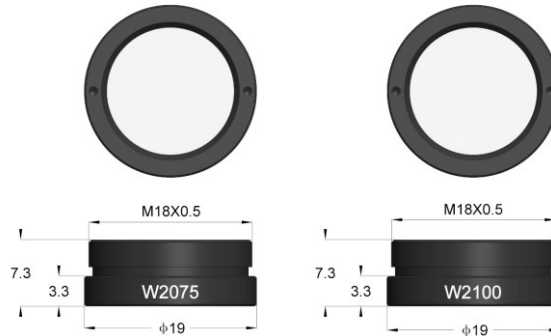


Figure 6-17 The Auxiliary Lens for TZM0745B MZO

6.3.4 TZM0745B MZO's TV Lens

The order number and optical parameters of TV Lens

Order number	The maximum compatible sensor size
TV2050	1/3"
TV2100	1/1.8"

Note: Smaller image sensors can also be used for [TV Lens](#) with higher magnification, but in this way, the [DFOV](#) of [MZO](#) will be reduced.

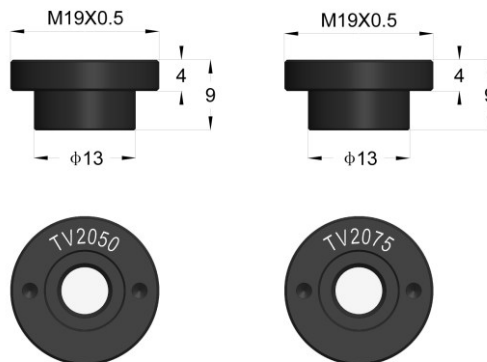


Figure 6-18 TV Lens with different magnification for TZM0745B

6.3.5 TZM0745B MZO's Bracket Adapter Module

The installation method of the [Bracket Adapter](#) ([TZM0745BA45](#), [TZM0745BA50](#)) and bracket is shown in below

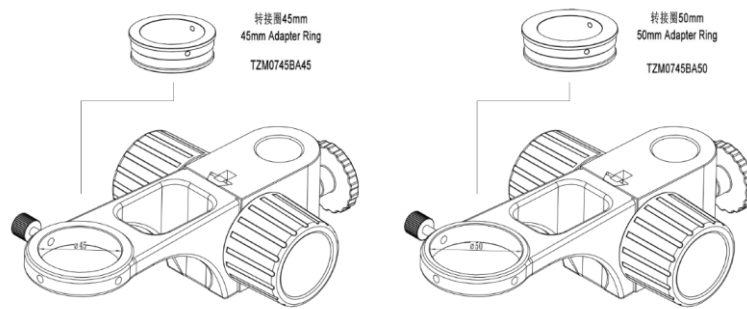


Figure 6-19 TZM0745B MZO's Bracket Adapter

6.3.6 TZM0745B MZO's Optional Module

The **Optional Modules** include **LED Direct Ring Light Module** and **Transmissive Light Module**. The currently possible samples are shown in table below.

Module	Order Number	Description
LED Direct Ring Light Module	TZM0745BDRL-65	LED Direct Ring Light
Transmissive Light Module	TZM0756TL	LED Transmissive Light
Power of Light Source	40600014	US:POWER-U-12V1A(Power Adapter American Standard)
	40600015	DE: POWER-E-12V1A(Power Adapter European standard)

6.3.7 The Optical Specifications of TZM0745B MZO with Different Auxiliary &TV Lens

The optical specifications of **TZM0745B MZO** with different **Auxiliary Lens** and **TV Lens** are shown in table below.

Order Number	Magnification of main body	Magnification of system	NA	Working distance(WD)	DFOV (mm)	The maximum compatible sensor size
TZM0745B-W2100-TV2050	0.7X-4.5X	0.35X-2.25X	0.016-0.07	95mm	17.14-2.67	1/3inch
TZM0745B-W2100-TV2075	0.7X-4.5X	0.53X-3.38X	0.016-0.07	95mm	17.14-2.67	1/1.8inch
TZM0745B-W2075-TV2050	0.7X-4.5X	0.26X-1.69X	0.012-0.053	127mm	22.86-3.56	1/3inch
TZM0745B-W2075-TV2075	0.7X-4.5X	0.39X-2.53X	0.012-0.053	127mm	22.86-3.56	1/1.8inch

WD: Working Distance; **DFOV:** Diagonal Field of View in the object side; **NA:** Numerical Aperture;

Note: Infinity corrected objectives limit system's usable zoom range due to uneven illumination. The maximum sensor size is 1/1.8".

6.3.8 The Dimension of TZM0745B MZO with Auxiliary Lens and TV Lens Configuration

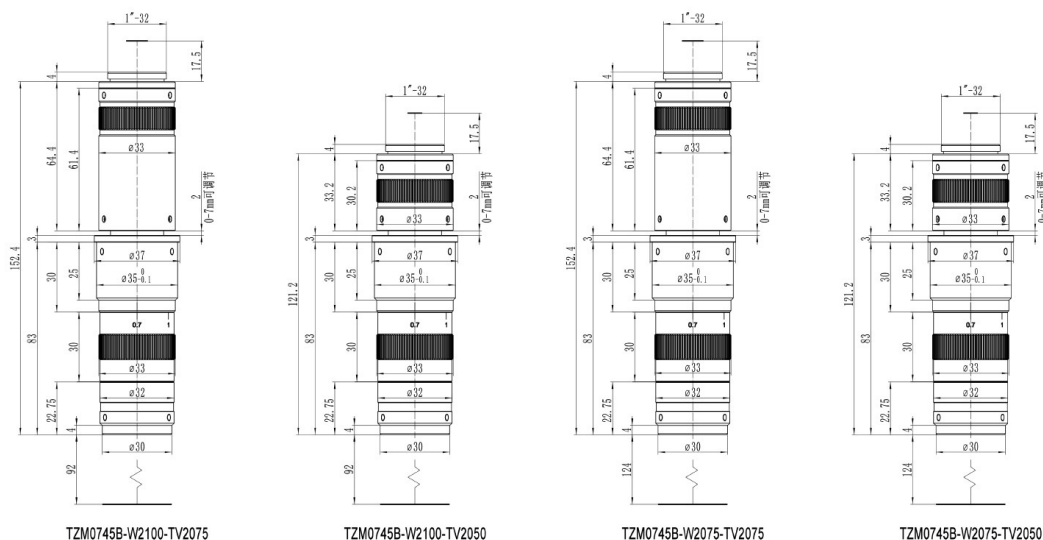


Figure 6-20 Dimensions of a)TZM0745B-W2100-TV2075; b) TZM0745B-W2100-TV2050; c) TZM0745B-W2075-TV2075 d) TZM0745B-W2075-TV2050

The length of the **MZO** with different **TV Lens** will be slightly different. The length of **TZM0745B-W2100-TV2050** is 121.22mm, it is much shorter than most of the MZO in the market.

6.3.9 TZM0745B MZO Packing List

The packing information of [TZM0745B MZO](#) is as follows with optional [Bracket Adapter A45](#) or [A50](#):



Figure 6-21 The TZM0745Bs main body (Can be TZM0745B-W2100-TV2050, TZM0745B-W2100-TV2075, TZM0745B-W2075-TV2050 or TZM0745B-W2075-TV2075) and Bracket Adapter

6.3.10 Order List of TZM0745B MZO

6.3.10.1 TZM0745B MZO Preconfigured Order List

Order number		Quantity	Remarks
Package Name	TZM0745B-W2100-TV2050		
	TZM0745B-W2100-TV2075		
	TZM0745B-W2075-TV2050		
	TZM0745B-W2075-TV2075		

6.3.10.2 TZM0745B Order List of Other Accessories

Module	Order number	Quantity	Remarks	Description
LED Direct Ring Light Module	TZM0745BDRL-65			LED Direct Ring Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(MSA-C10001C12.0-12H-US), Power Adapter American Standard
	40600015			POWER-E-12V1A(MSA-C10001C12.0-12W-DE), Power Adapter European Standard

6.4 TZM0480 MZO

6.4.1 The Configuration of TZM0480 MZO with Five Modules

TZM0480 MZO(Monocular Zoom Objective) is an ideal choice for most applications that requires multiple magnifications or for those that prohibits continual manual refocusing. The applications of the **TZM0480 MZO** are: machine vision; small details inspection; industrial inspection especially electronic components; scientific research; medical industry; education industry.

The modular design of **TZM0480 MZO** is showed in below. The design is based on the bilateral parallel light path principle and consists of five basic modules are: **Middle Zoom Module**, **Auxiliary Lens Module**, **TV Lens Module**, **Bracket Adapter Module** and **Optional Module**(Not show in the figure).

TZM0480 MZO can be combined with **Camera Module** (optional) to form a digital monocular zoom microscope.

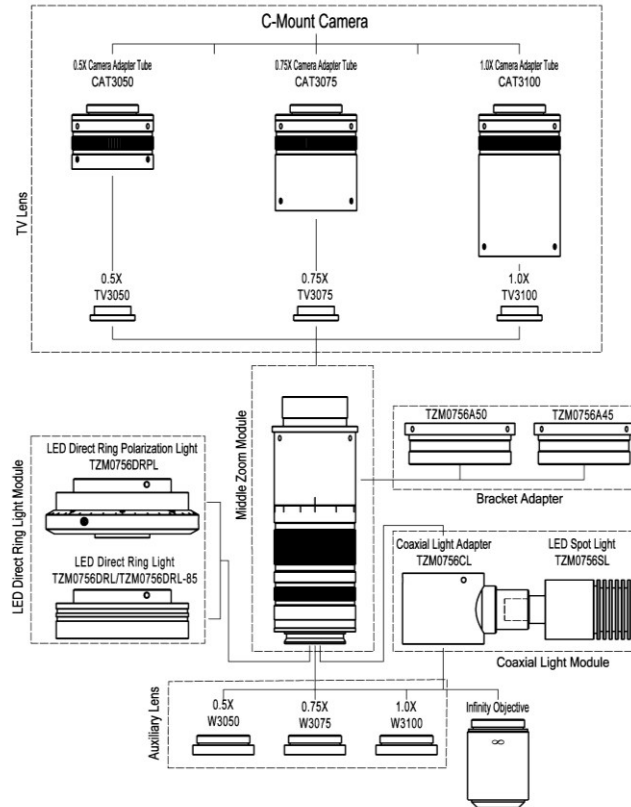


Figure 6-22 The five modules and the TZM0480 MZO

The basic module of **TZM0480 MZO** is **TZM0480-W3100-TV3100-A50**, it has 0.4X-8.0X zoom range and 20X zoom ratio. It is a high-quality precision **MZO** that provides high resolution and large depth of field. Its main features are shown below:

- With 0.4X~8.0X zoom range, 20X zoom ratio
- Larger NA: 0.01-0.12 (When using 1.00x **Auxiliary Lens**)
- Higher resolution: 27.5um-2.3um (When using 1.00x **Auxiliary Lens**)
- Larger field of view: 1.5mm-60mm (Object plane)
- Larger sensor size: 2/3" (When using 1.00x **TV Lens**)
- Working distance range: 86mm-174mm
- With adjustable BFL, parfocal in zoom range
- With adjustable center, the image center remains unchanged from 8.0x to 0.4x
- Compatible with infinity objectives (both biological and metallographic)
- Compact size: 194 mm (length) × 40 mm (diameter)
- **Auxiliary Lens** with 0.50x, 0.75x, 1.00x magnification (**Optional**)
- **TV Lens** with 0.50x, 0.75x, 1.00x magnification (**Optional**)
- Brightness adjustable **LED Direct Ring Light** (**Optional**)
- Brightness adjustable **LED Direct Ring Polarization Light** (**Optional**)
- Brightness adjustable **LED Coaxial Light** (**Optional**)
- **LED Transmissive Light** (**Optional**)
- 45mm or 50mm **Bracket Adapter** (**Optional**)



Figure 6-23 The TzM0480 MZO with different configuration

6.4.2 TzM0480 MZO's Middle Zoom Module

Order Number	Meaning	TzM0480	Postfix meaning
TzM0480	Ordinary Middle Zoom Module	ZM: Zoom 0480: 0.4X~8.0X	NA
TzM0480D	Middle Zoom Module with detent to fix the magnification function		D: Detent

6.4.3 TzM0480 MZO's Auxiliary Lens

Order number	Magnification	Working distance (mm)	Field of View in the object side(TV3050, 1/3"sensor)	
			Lower magnification	Higher magnification
W3050	0.5X	174	60.00mm	3.00mm
W3075	0.75X	115	40.00mm	2.00mm
W3100	1.00X	86	30.00mm	1.50mm

Note: The same **Auxiliary Lens** with different **TV lens** is just used to adapt to different size image sensor, which will not have much impact on the field of view of the **MZO**.

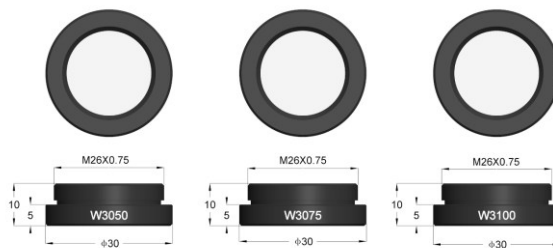


Figure 6-24 The Auxiliary Lens for TzM0480 MZO

6.4.4 TzM0480 MZO's TV Lens

Order number	The maximum compatible sensor size
TV3050	1/3"
TV3075	1/1.8"
TV3100	2/3"

Note: Smaller image sensors can also be used for **TV Lens** with higher magnification, but in this way, the **FOV** of **MZO** will be reduced.

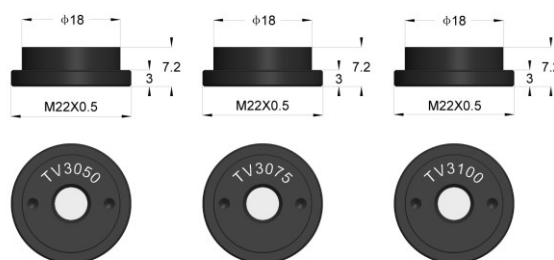


Figure 6-25 TV Lens with different magnification for TzM0480

6.4.5 TzM0480 MZO's Bracket Adapter

The installation method of the **Bracket Adapter** (TzM0756A45, TzM0756A50) and bracket is shown below.

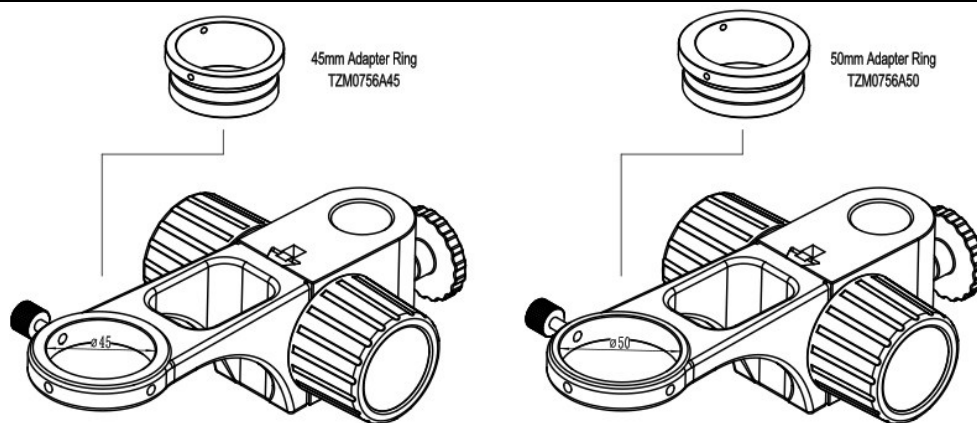


Figure 6-26 TZM0480 MZO's Bracket Adapter

6.4.6 TZM0480 MZO's Optional Module

The **Optional Modules** include **LED Direct Ring Light Module** (including **LED Direct Ring Light Module** and **LED Direct Ring Polarization Light Module**), **Coaxial Light Module** (composed of **Coaxial Light Adapter** and **LED Spot Light**) and **Transmissive Light Module**. The currently possible samples are shown in table below.

Module	Order Number	Description
LED Direct Ring Light Module	TZM0756DRL-65, TZM0756DRL-85	LED Direct Ring Light
	TZM0756DRPL-65	LED Direct Ring Polarization Light
Coaxial Light Module	TZM0756CL+TZM0756SL	Coaxial Light Adapter + LED Spot Light
Transmissive Light Module	TZM0756TL	LED Transmissive Light
Power of Light Source	40600014	US:POWER-U-12V1A(Power Adapter American Standard)
	40600015	DE: POWER-E-12V1A(Power Adapter European standard)

6.4.7 The Optical Specifications of TZM0480 MZO with Different Auxiliary &TV Lens

The optical specifications of TZM0480 MZO with different **Auxiliary Lens** and **TV Lens** are shown in table below. **Auxiliary Lens** and **TV Lens** with 1.00x(TZM0480-W3100-TV3100) are listed in the left-up cell. Its data is the basis of the other parameters in the whole table.

Auxiliary Lens	Specification	TV3100 2/3"(D=11mm)		TV3050 1/3"(D=6mm)		TV3075 1/2"(D=8mm)	
W3100 WD 86mm	PMAG	0.40-8.00		0.20-4.00		0.30-6.00	
	DFOV/mm	27.50	1.38	30.00	1.50	26.67	1.33
	NA	0.010	0.112	0.010	0.112	0.010	0.112
W3050 WD 174mm	PMAG	0.20-4.00		0.10-2.00		0.15-3.00	
	DFOV/mm	55.00	2.75	60.00	3.00	53.33	2.67
	NA	0.005	0.056	0.005	0.056	0.005	0.056
W3075 WD 115mm	PMAG	0.30-6.00		0.15-3.00		0.23-4.50	
	DFOV/mm	36.67	1.83	40.00	2.00	35.56	1.78
	NA	0.008	0.084	0.008	0.084	0.008	0.084

WD: Working Distance; PMAG: Primary Magnification; DFOV: Diagonal Field of View in the object side; NA: Numerical Aperture;

Note: Infinity corrected objectives limit system's usable zoom range due to uneven illumination. The maximum sensor size is 2/3".

6.4.8 The Dimension of TZM0480 MZO with Different Light Module

The dimension of TZM0480 series MZO with different **Auxiliary Lens** and **TV Lens** is shown below:

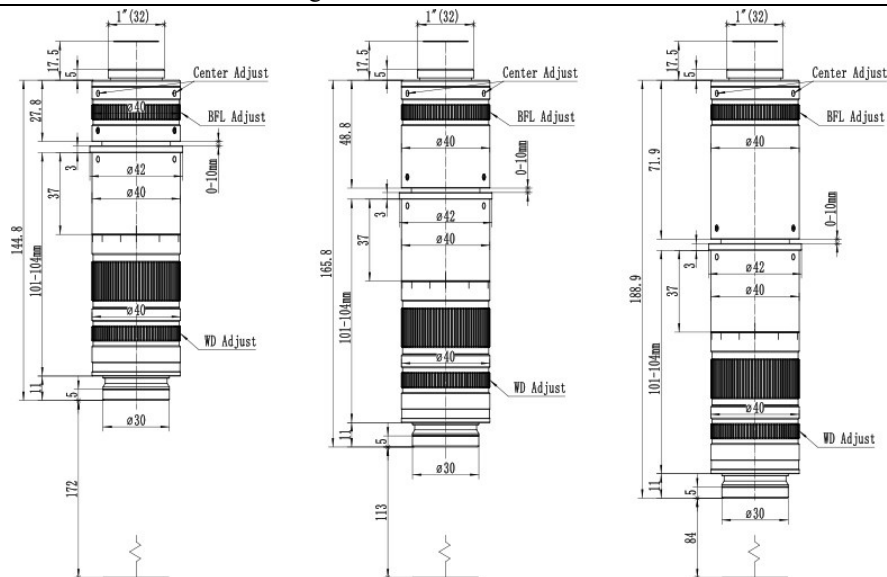


Figure 6-27 Dimension of TZM0480 series MZO with different Auxiliary Lens and TV Lens
a) TZM0480-W3050-TV3050; b) TZM0480-W3075-TV3075 c) TZM0480-W3100-TV3100

The length of the MZO with different TV Lens will be slightly different. The length of TZM0480-W3050-TV3050 is 144.8mm, it is much shorter than most of the MZO in the market.

6.4.9 How to Configure TZM0480 MZO

The corresponding parameters of TZM0480 MZO are listed in below. A specific combination can be determined according to the following steps.

- Confirm the possible range of 1) DFOV and 2) Working Distance in the object space to choose the Auxiliary Lens.
- Choose the M26x0.705 to M20x0.705 Objective Adapter, if the M20x0.705 mount infinity objective is used.
- Confirm the camera Image Area Size, it can be 1) Sensor Size (1/x in inch), 2) Image Diagonal Length, 3) Image Width or 4) Image Height to choose the right TV Lens.
- Choose the 45mm or 50 mm Bracket Adapter according to the diameter of the bracket hole diameter.
- Choose the LED Direct Ring Light Module for the reflective illumination.
- Choose the Coaxial Light Module if coaxial illumination is required.
- Choose the Transmissive Light Module if transmissive illumination is required.
- Choose the Camera Module.

We offer a variety of microscope cameras. Customers could get the detailed information of our cameras on the official website (<http://www.touptek.com/>) and choose the appropriate ones.

The combinations of different the Auxiliary Lens, The Middle Zoom Module and the TV Lens. With this figure, user can configure MZO with different magnification to fit different sensor and different application

Auxiliary Lens-Main Zoom Module-TV Lens	WD(mm)	PMAG	DFOV(mm)	NAO	Camera
TZM0480- W3050-TV3050	174	0.1X-2.0X	60.00-3.00	0.005-0.056	1/3inch
TZM0480- W3075-TV3050	115	0.15X-3.0X	40.00-2.00	0.008-0.084	
TZM0480- W3100-TV3050	86	0.2X-4.0X	30.00-1.50	0.010-0.112	
TZM0480- W3050-TV3075	174	0.15X-3.0X	53.33-2.67	0.005-0.056	1/2inch
TZM0480- W3075-TV3075	115	0.23X-4.5X	35.56-1.78	0.008-0.084	
TZM0480- W3100-TV3075	86	0.3X-6.0X	26.67-1.33	0.010-0.112	
TZM0480- W3050-TV3100	174	0.2X-4.0X	55.00-2.75	0.005-0.056	2/3inch
TZM0480- W3075-TV3100	115	0.3X-6.0X	36.67-1.83	0.008-0.084	
TZM0480- W3100-TV3100	86	0.4X-8.0X	27.50-1.38	0.010-0.112	

6.4.10 TZM0480 MZO's Packing List

The packing information of the TZM0480 MZO is as follows:



Figure 6-28 The TZM0480 main body, including Auxiliary Lens Module, Middle Zoom Module, TV Lens, Camera Adapter Tube and Bracket Adapter

6.4.11 Order List of TZM0480 MZO

6.4.11.1 TZM0480 Function Module Optional Order List

Module	Order number	Quantity	Remarks	Description
Middle Zoom Module	TZM0480			Ordinary Middle Zoom Module
	TZM0480D			Middle Zoom Module with detent
Auxiliary Lens Module	W3050			0.50X Object Lens
	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(American Standard)
	40600015			POWER-E-12V1A(European standard)

6.4.11.2 TZM0480 Monocular Zoom Object Package Order List

Order number		Quantity	Remarks
Package Name	TZM0480□-W3□□□-TV3□□□-A□□		
	TZM0480□-W3□□□-TV3□□□-A□□		
	TZM0480□-W3□□□-TV3□□□-A□□		
	TZM0480□-W3□□□-TV3□□□-A□□		
	TZM0480□-W3□□□-TV3□□□-A□□		
	TZM0480□-W3□□□-TV3□□□-A□□		
	TZM0480□-W3□□□-TV3□□□-A□□		
	TZM0480□-W3□□□-TV3□□□-A□□		
	TZM0480□-W3□□□-TV3□□□-A□□		
	TZM0480□-W3□□□-TV3□□□-A□□		
Remarks			
Remarks: Users or salesmen can directly write the corresponding module name, number of sets, and other special requirements in the remarks with their own professional knowledge.			

6.4.11.3 TZM0480 Order List of Other Accessories

Module	Order number	Quantity	Remarks	Description
	W3050			0.50X Object Lens

The Light Source for TZM0745B MZO

Auxiliary Lens Module	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL-65			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(MSA-C1000IC12.0-12H-US), Power Adapter American Standard
	40600015			POWER-E-12V1A(MSA-C1000IC12.0-12W-DE), Power Adapter European standard

6.5 TZM0460 MZO

6.5.1 The Configuration of TZM0460 MZO with Five Modules

TZM0460 MZO(Monocular Zoom Objective) is an ideal choice for most applications that requires multiple magnifications or for those that prohibits continual manual refocusing. The applications of the **TZM0460 MZO** are: machine vision; small details inspection; industrial inspection especially electronic components; scientific research; medical industry; education industry.

The modular design of **TZM0460 MZO** is showed in below. The design is based on the bilateral parallel light path principle and consists of five basic modules. The five basic modules are: **Middle Zoom Module**, **Auxiliary Lens Module**, **TV Lens Module**, **Bracket Adapter Module** and **Optional Module**(Not show in the figure).

TZM0460 MZO can be combined with **Camera Module** (optional) to form a digital monocular zoom microscope.

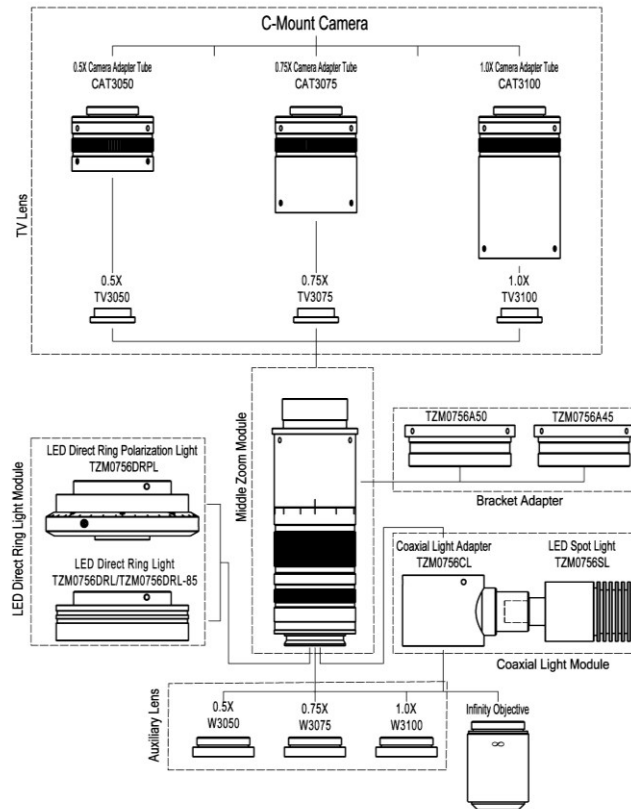


Figure 6-29 The five modules and the TZM0460 MZO

The basic module of **TZM0460 MZO** is **TZM0460-W3100-TV3100-A50**, it has 0.4X-6.0X zoom range and 15X zoom ratio. It is a high-quality precision **MZO** that provides high resolution and large depth of field. Its main features are shown below:

- With 0.4X~6.0X zoom range, 15X zoom ratio
- Larger NA: 0.01-0.09 (When using 1.00x **Auxiliary Lens**)
- Higher resolution: 27.5um-3.1um (When using 1.00x **Auxiliary Lens**)
- Larger field of view: 1.78mm-60mm (Object plane)
- Larger sensor size: 2/3" (When using 1.00x **TV Lens**)
- Working distance range: 86mm-174mm
- With adjustable BFL, parfocal in zoom range
- With adjustable center, the image center remains unchanged from 6.0x to 0.4x
- Compatible with infinity objectives (both biological and metallographic)
- Compact size: 194 mm (length) × 40 mm (diameter)
- **Auxiliary Lens** with 0.50x, 0.75x, 1.00x magnification (**Optional**)
- **TV Lens** with 0.50x, 0.75x, 1.00x magnification (**Optional**)
- Brightness adjustable **LED Direct Ring Light** (**Optional**)
- Brightness adjustable **LED Direct Ring Polarization Light** (**Optional**)
- Brightness adjustable **LED Coaxial Light** (**Optional**)
- **LED Transmissive Light** (**Optional**)
- 45mm or 50mm **Bracket Adapter** (**Optional**)



Figure 6-30 The TZM0460 MZO with different configuration

6.5.2 TZM0460 MZO's Middle Zoom Module

Order Number	Meaning	TZM0460	Postfix meaning
TZM0460	Ordinary Middle Zoom Module	ZM: Zoom 0460: 0.4X~6.0X	NA
TZM0460D	Middle Zoom Module with detent to fix the magnification function		D: Detent

6.5.3 TZM0460 MZO's Auxiliary Lens

Order number	Magnification	Working distance (mm)	Field of View in the object side(TV3050, 1/3"sensor)	
			Lower magnification	Higher magnification
W3050	0.5X	174	60.00mm	3.00mm
W3075	0.75X	115	40.00mm	2.00mm
W3100	1.00X	86	30.00mm	1.50mm

Note: The same **Auxiliary Lens** with different **TV lens** is just used to adapt to different size image sensor, which will not have much impact on the field of view of the **MZO**.

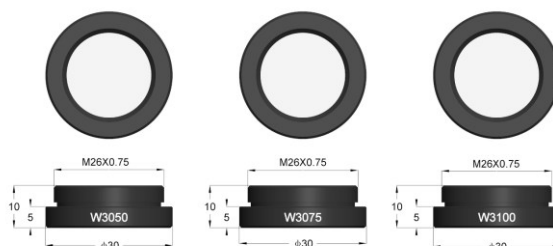


Figure 6-31 The Auxiliary Lens for TZM0460 MZO

6.5.4 TZM0460 MZO's TV Lens

Order number	The maximum compatible sensor size
TV3050	1/3"
TV3075	1/1.8"
TV3100	2/3"

Note: Smaller image sensors can also be used for **TV Lens** with higher magnification, but in this way, the **FOV** of **MZO** will be reduced.

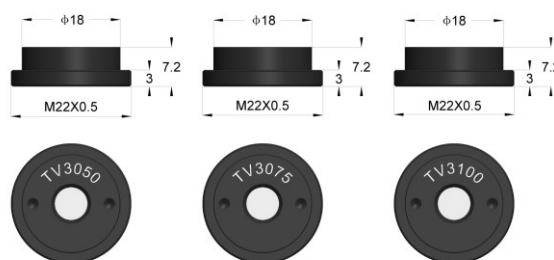


Figure 6-32 TV Lens with different magnification for TZM0460

6.5.5 TZM0460 MZO's Bracket Adapter

The installation method of the **Bracket Adapter** (TZM0756A45, TZM0756A50) and bracket is shown below.

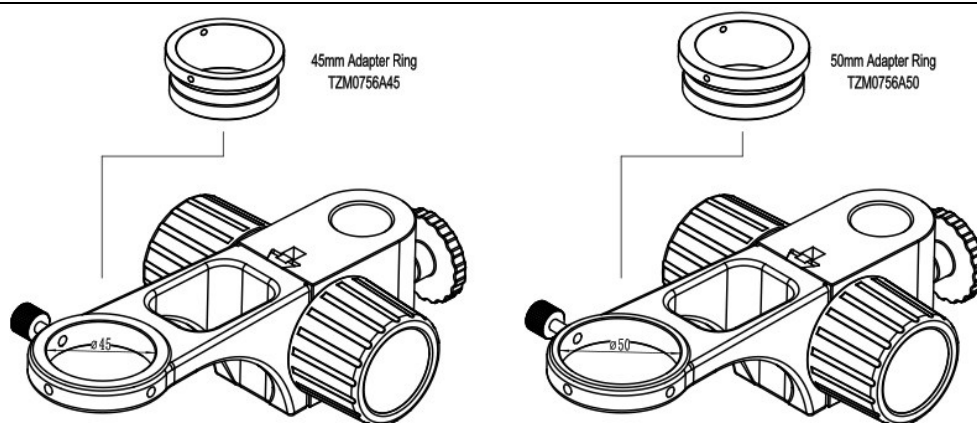


Figure 6-33 TZM0460 MZO's Bracket Adapter

6.5.6 TZM0460 MZO's Optional Module

The **Optional Modules** include **LED Direct Ring Light Module** (including **LED Direct Ring Light Module** and **LED Direct Ring Polarization Light Module**), **Coaxial Light Module** (composed of **Coaxial Light Adapter** and **LED Spot Light**) and **Transmissive Light Module**. The currently possible samples are shown in table below.

Module	Order Number	Description
LED Direct Ring Light Module	TZM0756DRL-65, TZM0756DRL-85	LED Direct Ring Light
	TZM0756DRPL-65	LED Direct Ring Polarization Light
Coaxial Light Module	TZM0756CL+TZM0756SL	Coaxial Light Adapter + LED Spot Light
Transmissive Light Module	TZM0756TL	LED Transmissive Light
Power of Light Source	40600014	US:POWER-U-12V1A(Power Adapter American Standard)
	40600015	DE: POWER-E-12V1A(Power Adapter European standard)

6.5.7 The Optical Specifications of TZM0460 MZO with Different Auxiliary &TV Lens

The optical specifications of TZM0460 MZO with different **Auxiliary Lens** and **TV Lens** are shown in table below. **Auxiliary Lens** and **TV Lens** with 1.00x(TZM0460-W3100-TV3100) are listed in the left-up cell. Its data is the basis of the other parameters in the whole table.

Auxiliary Lens	Specification	TV3100 2/3"(D=11mm)		TV3050 1/3"(D=6mm)		TV3075 1/2"(D=8mm)	
W3100 WD 86mm	PMAG	0.40-6.00		0.20-3.00		0.30-4.50	
	DFOV/mm	27.50	1.83	1.83	1.83	26.67	1.78
	NA	0.010	0.090	0.090	0.090	0.010	0.090
W3050 WD 174mm	PMAG	0.20-3.00		0.10-1.50		0.15-2.25	
	DFOV/mm	55.00	3.67	3.67	3.67	53.33	3.56
	NA	0.005	0.045	0.045	0.045	0.005	0.045
W3075 WD 115mm	PMAG	0.30-4.50		0.15-2.25		0.23-3.38	
	DFOV/mm	36.67	2.44	2.44	2.44	35.56	2.37
	NA	0.008	0.068	0.068	0.068	0.008	0.068

WD: Working Distance; **PMAG:** Primary Magnification; **DFOV:** Diagonal Field of View in the object side; **NA:** Numerical Aperture;

Note: Infinity corrected objectives limit system's usable zoom range due to uneven illumination. The maximum sensor size is 2/3".

6.5.8 The Dimension of TZM0460 MZO with Different Light Module

The dimension of TZM0460 series MZO with different **Auxiliary Lens** and **TV Lens** is shown below:

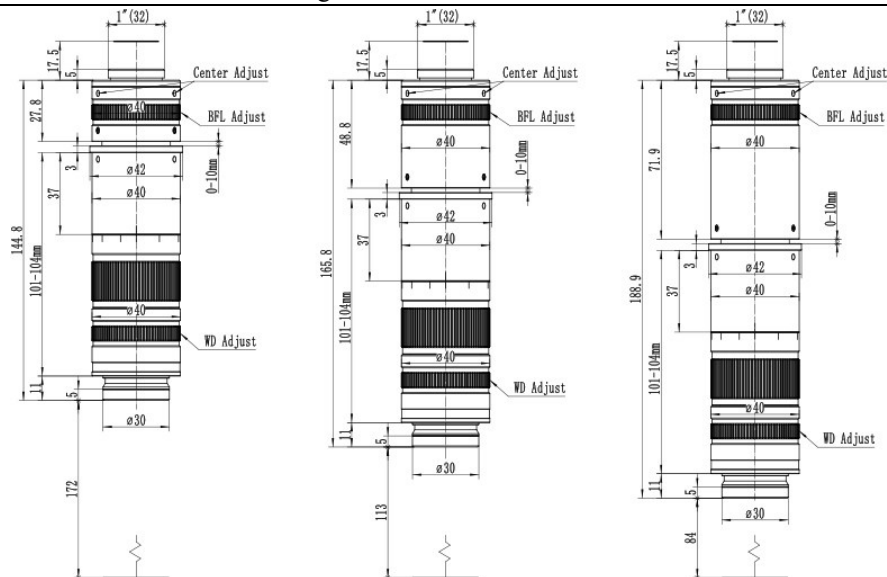


Figure 6-34 Dimension of TZM0460 series MZO with different Auxiliary Lens and TV Lens
a) TZM0460-W3050-TV3050; b) TZM0460-W3075-TV3075 c) TZM0460-W3100-TV3100

The length of the MZO with different TV Lens will be slightly different. The length of TZM0460-W3050-TV3050 is 144.8mm, it is much shorter than most of the MZO in the market.

6.5.9 How to Configure TZM0460 MZO

The corresponding parameters of TZM0460 MZO are listed in below. A specific combination can be determined according to the following steps.

- Confirm the possible range of 1) DFOV and 2) Working Distance in the object space to choose the Auxiliary Lens.
- Choose the M26x0.705 to M20x0.705 Objective Adapter, if the M20x0.705 mount infinity objective is used.
- Confirm the camera Image Area Size, it can be 1) Sensor Size (1/x in inch), 2) Image Diagonal Length, 3) Image Width or 4) Image Height to choose the right TV Lens.
- Choose the 45mm or 50 mm Bracket Adapter according to the diameter of the bracket hole diameter.
- Choose the LED Direct Ring Light Module for the reflective illumination.
- Choose the Coaxial Light Module if coaxial illumination is required.
- Choose the Transmissive Light Module if transmissive illumination is required.
- Choose the Camera Module.

We offer a variety of microscope cameras. Customers could get the detailed information of our cameras on the official website (<http://www.touptek.com/>) and choose the appropriate ones.

The combinations of different the Auxiliary Lens, The Middle Zoom Module and the TV Lens. With this figure, user can configure MZO with different magnification to fit different sensor and different application

Auxiliary Lens-Main Zoom Module-TV Lens	WD(mm)	PMAG	DFOV(mm)	NAO	Camera
TZM0460-W3050-TV3050	174	0.1X-1.5X	60.00-4.00	0.005-0.045	1/3inch
TZM0460-W3075-TV3050	115	0.15X-2.25X	40.00-2.67	0.008-0.068	
TZM0460-W3100-TV3050	86	0.2X-3.0X	30.00-2.00	0.010-0.090	
TZM0460-W3050-TV3075	174	0.15X-2.25X	53.33-3.56	0.005-0.045	1/2inch
TZM0460-W3075-TV3075	115	0.23X-3.38X	35.56-2.37	0.008-0.068	
TZM0460-W3100-TV3075	86	0.3X-4.50X	26.67-1.78	0.010-0.090	
TZM0460-W3050-TV3100	174	0.2X-3.0X	55.00-3.67	0.005-0.045	2/3inch
TZM0460-W3075-TV3100	115	0.3X-4.5X	36.67-2.44	0.008-0.068	
TZM0460-W3100-TV3100	86	0.4X-6.0X	27.50-1.83	0.010-0.090	

6.5.10 TZM0460 MZO's Packing List

The packing information of the TZM0460 MZO is as follows:



Figure 6-35 The TZM0460 main body, including Auxiliary Lens Module, Middle Zoom Module, TV Lens, Camera Adapter Tube and Bracket Adapter

6.5.11 Order List of TZM0460 MZO

6.5.11.1 TZM0460 Function Module Optional Order List

Module	Order number	Quantity	Remarks	Description
Middle Zoom Module	TZM0460			Ordinary Middle Zoom Module
	TZM0460D			Middle Zoom Module with detent
Auxiliary Lens Module	W3050			0.50X Object Lens
	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(American Standard)
	40600015			POWER-E-12V1A(European standard)

6.5.11.2 TZM0460 Monocular Zoom Object Package Order List

Order number		Quantity	Remarks
Package Name	TZM0460□-W3□□□-TV3□□□-A□□		
	TZM0460□-W3□□□-TV3□□□-A□□		
	TZM0460□-W3□□□-TV3□□□-A□□		
	TZM0460□-W3□□□-TV3□□□-A□□		
	TZM0460□-W3□□□-TV3□□□-A□□		
	TZM0460□-W3□□□-TV3□□□-A□□		
	TZM0460□-W3□□□-TV3□□□-A□□		
	TZM0460□-W3□□□-TV3□□□-A□□		
	TZM0460□-W3□□□-TV3□□□-A□□		
	TZM0460□-W3□□□-TV3□□□-A□□		
Remarks			
Remarks: Users or salesmen can directly write the corresponding module name, number of sets, and other special requirements in the remarks with their own professional knowledge.			

6.5.11.3 TZM0460 Order List of Other Accessories

Module	Order number	Quantity	Remarks	Description
	W3050			0.50X Object Lens

The Light Source for TzM0460 MZO

Auxiliary Lens Module	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL-65			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(MSA-C1000IC12.0-12H-US), Power Adapter American Standard
	40600015			POWER-E-12V1A(MSA-C1000IC12.0-12W-DE), Power Adapter European standard

6.6 TzM0440 MZO

6.6.1 The Configuration of TzM0440 MZO with Five Modules

TzM0440 MZO (Monocular Zoom Objective) is an ideal choice for most applications that requires multiple magnifications or for those that prohibits continual manual refocusing. The applications of the TzM0440 MZO are: machine vision; small details inspection; industrial inspection especially electronic components; scientific research; medical industry; education industry.

The modular design of TzM0440 MZO is showed in below. The design is based on the bilateral parallel light path principle and consists of five basic modules. The five basic modules are: Middle Zoom Module, Auxiliary Lens Module, TV Lens Module, Bracket Adapter Module and Optional Module (Not show in the figure).

TzM0440 MZO can be combined with Camera Module (optional) to form a digital monocular zoom microscope.

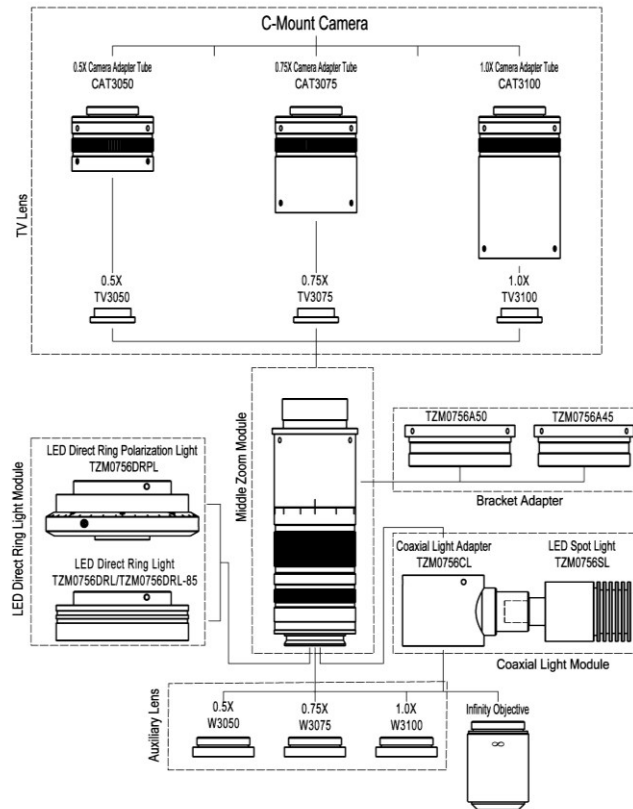


Figure 6-36 The five modules and the TzM0440 MZO

The basic module of TzM0440 MZO is TzM0440-W3100-TV3100-A50, it has 0.4X-4.0X zoom range and 10X zoom ratio. It is a high-quality precision MZO that provides high resolution and large depth of field. Its main features are shown below:

- With 0.4X~4.0X zoom range, 10X zoom ratio
- Larger NA: 0.01-0.07 (When using 1.00x Auxiliary Lens)
- Higher resolution: 27.5 μ m-4.1 μ m (When using 1.00x Auxiliary Lens)
- Larger field of view: 2.67mm-60mm (Object plane)
- Larger sensor size: 2/3" (When using 1.00x TV Lens)
- Working distance range: 86mm-174mm
- With adjustable BFL, parfocal in zoom range
- With adjustable center, the image center remains unchanged from 4.0x to 0.4x
- Compatible with infinity objectives (both biological and metallographic)
- Compact size: 194 mm (length) $\times$ 40 mm (diameter)
- Auxiliary Lens with 0.50x, 0.75x, 1.00x magnification (Optional)
- TV Lens with 0.50x, 0.75x, 1.00x magnification (Optional)
- Brightness adjustable LED Direct Ring Light (Optional)
- Brightness adjustable LED Direct Ring Polarization Light (Optional)
- Brightness adjustable LED Coaxial Light (Optional)
- LED Transmissive Light (Optional)
- 45mm or 50mm Bracket Adapter (Optional)



Figure 6-37 The TZM0440 MZO with different configuration

6.6.2 TZM0440 MZO's Middle Zoom Module

Order Number	Meaning	TZM0440	Postfix meaning
TZM0440	Ordinary Middle Zoom Module	ZM: Zoom 0440: 0.4X~4.0X	NA
TZM0440D	Middle Zoom Module with detent to fix the magnification function		D: Detent

6.6.3 TZM0440 MZO's Auxiliary Lens

Order number	Magnification	Working distance (mm)	Field of View in the object side(TV3050, 1/3"sensor)	
			Lower magnification	Higher magnification
W3050	0.5X	174	60.00mm	3.00mm
W3075	0.75X	115	40.00mm	2.00mm
W3100	1.00X	86	30.00mm	1.50mm

Note: The same **Auxiliary Lens** with different **TV lens** is just used to adapt to different size image sensor, which will not have much impact on the field of view of the **MZO**.

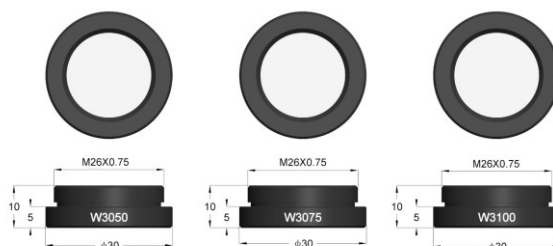


Figure 6-38 The Auxiliary Lens for TZM0440 MZO

6.6.4 TZM0440 MZO's TV Lens

Order number	The maximum compatible sensor size
TV3050	1/3"
TV3075	1/1.8"
TV3100	2/3"

Note: Smaller image sensors can also be used for **TV Lens** with higher magnification, but in this way, the **FOV** of **MZO** will be reduced.

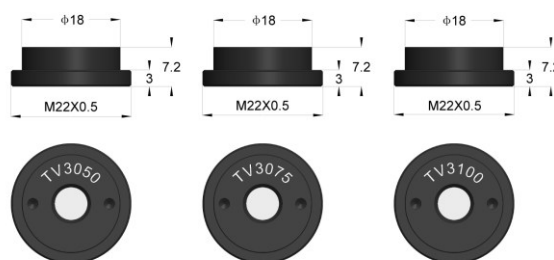


Figure 6-39 TV Lens with different magnification for TZM0440

6.6.5 TZM0440 MZO's Bracket Adapter

The installation method of the **Bracket Adapter** (TZM0756A45, TZM0756A50) and bracket is shown below.

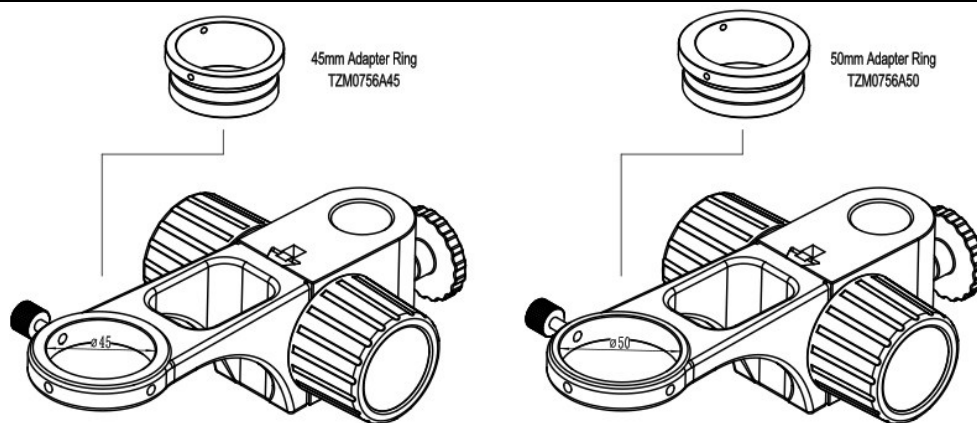


Figure 6-40 TZM0440 MZO's Bracket Adapter

6.6.6 TZM0440 MZO's Optional Module

The **Optional Modules** include **LED Direct Ring Light Module** (including **LED Direct Ring Light Module** and **LED Direct Ring Polarization Light Module**), **Coaxial Light Module** (composed of **Coaxial Light Adapter** and **LED Spot Light**) and **Transmissive Light Module**. The currently possible samples are shown in table below.

Module	Order Number	Description
LED Direct Ring Light Module	TZM0756DRL-65, TZM0756DRL-85	LED Direct Ring Light
	TZM0756DRPL-65	LED Direct Ring Polarization Light
Coaxial Light Module	TZM0756CL+TZM0756SL	Coaxial Light Adapter + LED Spot Light
Transmissive Light Module	TZM0756TL	LED Transmissive Light
Power of Light Source	40600014	US:POWER-U-12V1A(Power Adapter American Standard)
	40600015	DE: POWER-E-12V1A(Power Adapter European standard)

6.6.7 The Optical Specifications of TZM0440 MZO with Different Auxiliary &TV Lens

The optical specifications of TZM0440 MZO with different **Auxiliary Lens** and **TV Lens** are shown in table below. **Auxiliary Lens** and **TV Lens** with 1.00x(TZM0440-W3100-TV3100) are listed in the left-up cell. Its data is the basis of the other parameters in the whole table.

Auxiliary Lens	Specification	TV3100 2/3"(D=11mm)		TV3050 1/3"(D=6mm)		TV3075 1/2"(D=8mm)	
W3100 WD 86mm	PMAG	0.40-4.00		0.20-2.00		0.30-3.00	
	DFOV/mm	27.50	2.75	30.00	3.00	26.67	2.67
	NA	0.010	0.067	0.010	0.067	0.010	0.067
W3050 WD 174mm	PMAG	0.20-2.00		0.10-1.00		0.15-1.50	
	DFOV/mm	55.00	5.50	60.00	6.00	53.33	5.33
	NA	0.005	0.033	0.005	0.033	0.005	0.033
W3075 WD 115mm	PMAG	0.30-3.00		0.15-1.50		0.23-2.25	
	DFOV/mm	36.67	3.67	40.00	4.00	35.56	3.56
	NA	0.008	0.050	0.008	0.050	0.008	0.050

WD: Working Distance; **PMAG:** Primary Magnification; **DFOV:** Diagonal Field of View in the object side; **NA:** Numerical Aperture;

Note: Infinity corrected objectives limit system's usable zoom range due to uneven illumination. The maximum sensor size is 2/3".

6.6.8 The Dimension of TZM0440 MZO with Different Light Module

The dimension of TZM0440 series MZO with different **Auxiliary Lens** and **TV Lens** is shown below:

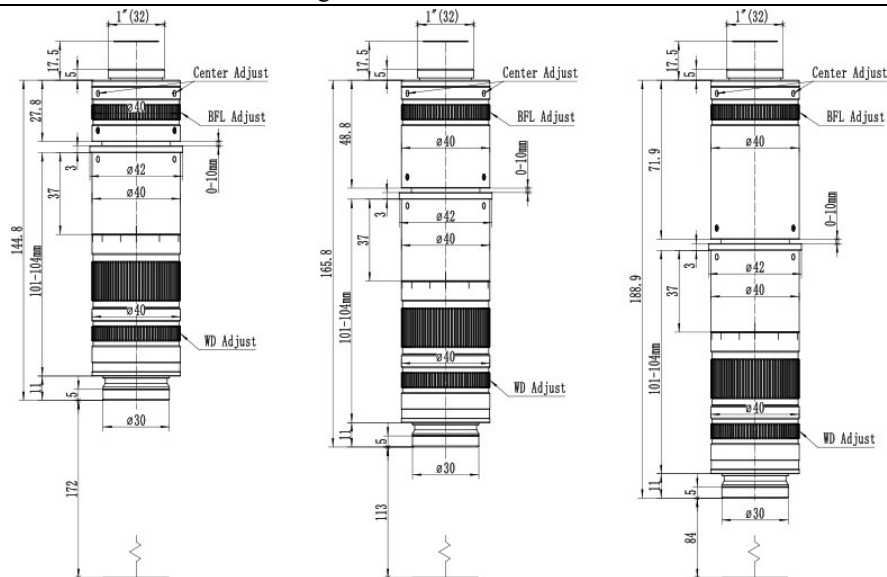


Figure 6-41 Dimension of TZM0440 series MZO with different Auxiliary Lens and TV Lens
a) TZM0440-W3050-TV3050; b) TZM0440-W3075-TV3075 c) TZM0440-W3100-TV3100

The length of the MZO with different TV Lens will be slightly different. The length of TZM0440-W3050-TV3050 is 144.8mm, it is much shorter than most of the MZO in the market.

6.6.9 How to Configure TZM0440 MZO

The corresponding parameters of TZM0440 MZO are listed in below. A specific combination can be determined according to the following steps.

- Confirm the possible range of 1) DFOV and 2) Working Distance in the object space to choose the Auxiliary Lens.
- Choose the M26x0.705 to M20x0.705 Objective Adapter, if the M20x0.705 mount infinity objective is used.
- Confirm the camera Image Area Size, it can be 1) Sensor Size (1/x in inch), 2) Image Diagonal Length, 3) Image Width or 4) Image Height to choose the right TV Lens.
- Choose the 45mm or 50 mm Bracket Adapter according to the diameter of the bracket hole diameter.
- Choose the LED Direct Ring Light Module for the reflective illumination.
- Choose the Coaxial Light Module if coaxial illumination is required.
- Choose the Transmissive Light Module if transmissive illumination is required.
- Choose the Camera Module.

We offer a variety of microscope cameras. Customers could get the detailed information of our cameras on the official website (<http://www.touptek.com/>) and choose the appropriate ones.

The combinations of different the Auxiliary Lens, The Middle Zoom Module and the TV Lens. With this figure, user can configure MZO with different magnification to fit different sensor and different application

Auxiliary Lens-Main Zoom Module-TV Lens	WD(mm)	PMAG	DFOV(mm)	NAO	Camera
TZM0440-W3050-TV3050	174	0.1X-1.0X	60.00-6.00	0.005-0.033	1/3inch
TZM0440-W3075-TV3050	115	0.15X-1.5X	40.00-4.00	0.008-0.05	
TZM0440-W3100-TV3050	86	0.2X-2.0X	30.00-3.00	0.010-0.067	
TZM0440-W3050-TV3075	174	0.15X-1.5X	53.33-5.33	0.005-0.033	1/2inch
TZM0440-W3075-TV3075	115	0.23X-2.23X	35.56-3.56	0.008-0.005	
TZM0440-W3100-TV3075	86	0.3X-3.0X	26.67-2.67	0.010-0.067	
TZM0440-W3050-TV3100	174	0.2X-2.0X	55.00-5.5	0.005-0.033	2/3inch
TZM0440-W3075-TV3100	115	0.3X-3.0X	36.67-3.67	0.008-0.05	
TZM0440-W3100-TV3100	86	0.4X-4.0X	27.50-2.75	0.010-0.067	

6.6.10 TZM0440 MZO's Packing List

The packing information of the TZM0440 MZO is as follows:



Figure 6-42 The TZM0440 main body, including Auxiliary Lens Module, Middle Zoom Module, TV Lens, Camera Adapter Tube and Bracket Adapter

6.6.11 Order List of TZM0440 MZO

6.6.11.1 TZM0440 Function Module Optional Order List

Module	Order number	Quantity	Remarks	Description
Middle Zoom Module	TZM0440			Ordinary Middle Zoom Module
	TZM0440D			Middle Zoom Module with detent
Auxiliary Lens Module	W3050			0.50X Object Lens
	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(American Standard)
	40600015			POWER-E-12V1A(European standard)

6.6.11.2 TZM0440 Monocular Zoom Object Package Order List

Order number		Quantity	Remarks
Package Name	TZM0440□-W3□□□-TV3□□□-A□□		
	TZM0440□-W3□□□-TV3□□□-A□□		
	TZM0440□-W3□□□-TV3□□□-A□□		
	TZM0440□-W3□□□-TV3□□□-A□□		
	TZM0440□-W3□□□-TV3□□□-A□□		
	TZM0440□-W3□□□-TV3□□□-A□□		
	TZM0440□-W3□□□-TV3□□□-A□□		
	TZM0440□-W3□□□-TV3□□□-A□□		
	TZM0440□-W3□□□-TV3□□□-A□□		
	TZM0440□-W3□□□-TV3□□□-A□□		
Remarks			
Remarks: Users or salesmen can directly write the corresponding module name, number of sets, and other special requirements in the remarks with their own professional knowledge.			

6.6.11.3 TZM0440 Order List of Other Accessories

Module	Order number	Quantity	Remarks	Description
	W3050			0.50X Object Lens

The Light Source for TzM0660 MZO

Auxiliary Lens Module	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL-65			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(MSA-C1000IC12.0-12H-US), Power Adapter American Standard
	40600015			POWER-E-12V1A(MSA-C1000IC12.0-12W-DE), Power Adapter European standard

6.7 TzM0660 MZO

6.7.1 The Configuration of TzM0660 MZO with Five Modules

TzM0660 MZO (Monocular Zoom Objective) is an ideal choice for most applications that requires multiple magnifications or for those that prohibits continual manual refocusing. The applications of the TzM0660 MZO are: machine vision; small details inspection; industrial inspection especially electronic components; scientific research; medical industry; education industry.

The modular design of TzM0660 MZO is showed in below. The design is based on the bilateral parallel light path principle and consists of five basic modules. The five basic modules are: Middle Zoom Module, Auxiliary Lens Module, TV Lens Module, Bracket Adapter Module and Optional Module (Not show in the figure).

TzM0660 MZO can be combined with Camera Module (optional) to form a digital monocular zoom microscope.

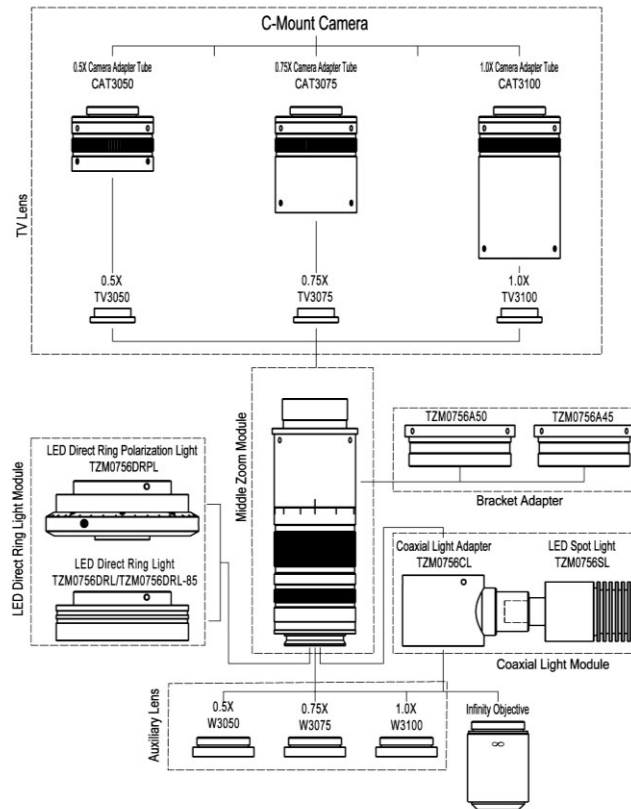


Figure 6-43 The five modules and the TzM0660 MZO

The basic module of TzM0660 MZO is TzM0660-W3100-TV3100-A50, it has 0.6X-6.0X zoom range and 10X zoom ratio. It is a high-quality precision MZO that provides high resolution and large depth of field. Its main features are shown below:

- With 0.6X~6.0X zoom range, 10X zoom ratio
- Larger NA: 0.015-0.09 (When using 1.00x Auxiliary Lens)
- Higher resolution: 18.3um-3.1um (When using 1.00x Auxiliary Lens)
- Larger field of view: 1.78mm-40mm (Object plane)
- Larger sensor size: 2/3" (When using 1.00x TV Lens)
- Working distance range: 86mm-174mm
- With adjustable BFL, parfocal in zoom range
- With adjustable center, the image center remains unchanged from 6.0x to 0.6x
- Compatible with infinity objectives (both biological and metallographic)
- Compact size: 194 mm (length) × 40 mm (diameter)
- Auxiliary Lens with 0.50x, 0.75x, 1.00x magnification (Optional)
- TV Lens with 0.50x, 0.75x, 1.00x magnification (Optional)
- Brightness adjustable LED Direct Ring Light (Optional)
- Brightness adjustable LED Direct Ring Polarization Light (Optional)
- Brightness adjustable LED Coaxial Light (Optional)
- LED Transmissive Light (Optional)
- 45mm or 50mm Bracket Adapter (Optional)



Figure 6-44 The TZM0660 MZO with different configuration

6.7.2 TZM0660 MZO's Middle Zoom Module

Order Number	Meaning	TZM0660	Postfix meaning
TZM0660	Ordinary Middle Zoom Module	ZM: Zoom 0660: 0.6X~6.0X	NA
TZM0660D	Middle Zoom Module with detent to fix the magnification function		D: Detent

6.7.3 TZM0660 MZO's Auxiliary Lens

Order number	Magnification	Working distance (mm)	Field of View in the object side(TV3050, 1/3"sensor)	
			Lower magnification	Higher magnification
W3050	0.5X	174	60.00mm	3.00mm
W3075	0.75X	115	40.00mm	2.00mm
W3100	1.00X	86	30.00mm	1.50mm

Note: The same **Auxiliary Lens** with different **TV lens** is just used to adapt to different size image sensor, which will not have much impact on the field of view of the **MZO**.

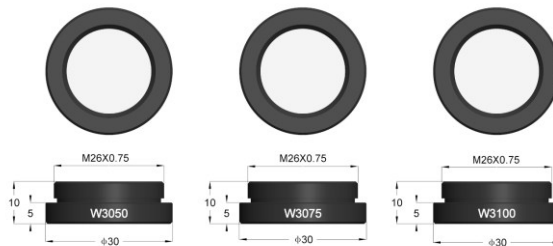


Figure 6-45 The Auxiliary Lens for TZM0660 MZO

6.7.4 TZM0660 MZO's TV Lens

Order number	The maximum compatible sensor size
TV3050	1/3"
TV3075	1/1.8"
TV3100	2/3"

Note: Smaller image sensors can also be used for **TV Lens** with higher magnification, but in this way, the **FOV** of **MZO** will be reduced.

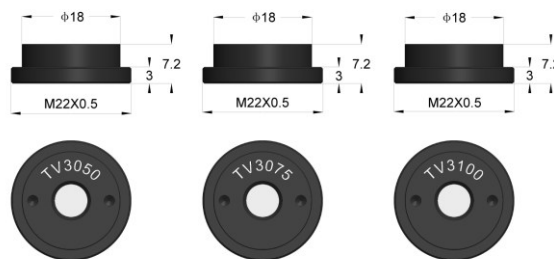


Figure 6-46 TV Lens with different magnification for TZM0660

6.7.5 TZM0660 MZO's Bracket Adapter

The installation method of the **Bracket Adapter** (**TZM0756A45**, **TZM0756A50**) and bracket is shown below.

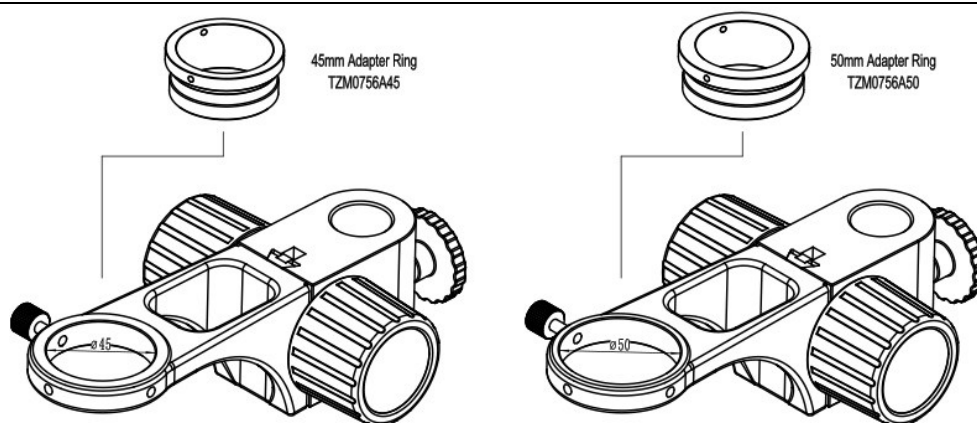


Figure 6-47 TZM0660 MZO's Bracket Adapter

6.7.6 TZM0660 MZO's Optional Module

The **Optional Modules** include **LED Direct Ring Light Module** (including **LED Direct Ring Light Module** and **LED Direct Ring Polarization Light Module**), **Coaxial Light Module** (composed of **Coaxial Light Adapter** and **LED Spot Light**) and **Transmissive Light Module**. The currently possible samples are shown in table below.

Module	Order Number	Description
LED Direct Ring Light Module	TZM0756DRL-65, TZM0756DRL-85	LED Direct Ring Light
	TZM0756DRPL-65	LED Direct Ring Polarization Light
Coaxial Light Module	TZM0756CL+TZM0756SL	Coaxial Light Adapter + LED Spot Light
Transmissive Light Module	TZM0756TL	LED Transmissive Light
Power of Light Source	40600014	US:POWER-U-12V1A(Power Adapter American Standard)
	40600015	DE: POWER-E-12V1A(Power Adapter European standard)

6.7.7 The Optical Specifications of TZM0660 MZO with Different Auxiliary &TV Lens

The optical specifications of TZM0660 MZO with different **Auxiliary Lens** and **TV Lens** are shown in table below. **Auxiliary Lens** and **TV Lens** with 1.00x(TZM0660-W3100-TV3100) are listed in the left-up cell. Its data is the basis of the other parameters in the whole table.

Auxiliary Lens	Specification	TV3100 2/3"(D=11mm)		TV3050 1/3"(D=6mm)		TV3075 1/2"(D=8mm)	
W3100 WD 86mm	PMAG	0.60-6.00		0.30-3.00		0.45-4.50	
	DFOV/mm	18.33	1.83	20.00	2.00	17.78	1.78
	NA	0.015	0.090	0.015	0.090	0.015	0.090
W3050 WD 174mm	PMAG	0.30-3.00		0.15-1.50		0.23-2.25	
	DFOV/mm	36.67	3.67	40.00	4.00	35.56	3.56
	NA	0.007	0.045	0.007	0.045	0.007	0.045
W3075 WD 115mm	PMAG	0.45-4.50		0.23-2.25		0.34-3.38	
	DFOV/mm	24.44	2.44	26.67	2.67	23.70	2.37
	NA	0.011	0.068	0.011	0.068	0.011	0.068

WD: Working Distance; **PMAG:** Primary Magnification; **DFOV:** Diagonal Field of View in the object side; **NA:** Numerical Aperture;

Note: Infinity corrected objectives limit system's usable zoom range due to uneven illumination. The maximum sensor size is 2/3".

6.7.8 The Dimension of TZM0660 MZO with Different Light Module

The dimension of TZM0660 series MZO with different **Auxiliary Lens** and **TV Lens** is shown below:

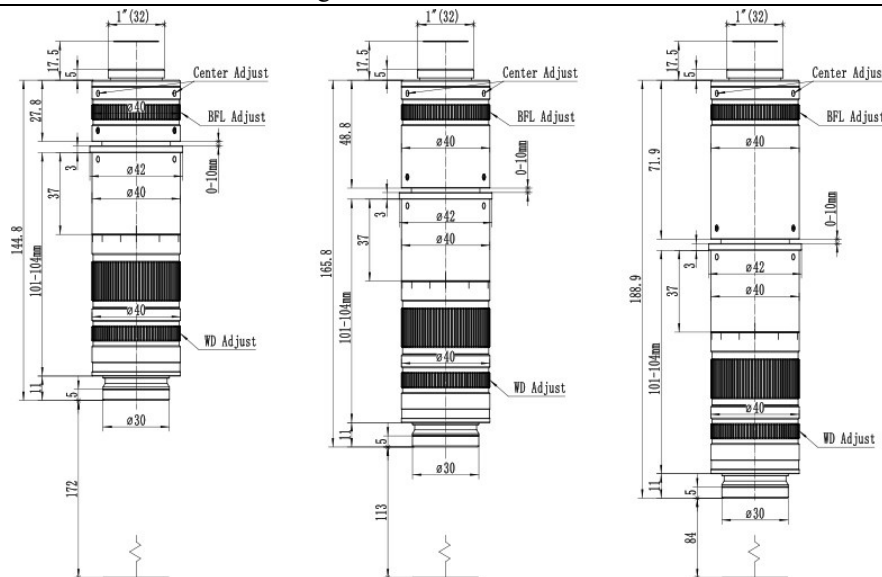


Figure 6-48 Dimension of TZM0660 series MZO with different Auxiliary Lens and TV Lens
a) TZM0660-W3050-TV3050; b) TZM0660-W3075-TV3075 c) TZM0660-W3100-TV3100

The length of the MZO with different TV Lens will be slightly different. The length of TZM0660-W3050-TV3050 is 144.8mm, it is much shorter than most of the MZO in the market.

6.7.9 How to Configure TZM0660 MZO

The corresponding parameters of TZM0660 MZO are listed in below. A specific combination can be determined according to the following steps.

- Confirm the possible range of 1) DFOV and 2) Working Distance in the object space to choose the Auxiliary Lens.
- Choose the M26x0.705 to M20x0.705 Objective Adapter, if the M20x0.705 mount infinity objective is used.
- Confirm the camera Image Area Size, it can be 1) Sensor Size (1/x in inch), 2) Image Diagonal Length, 3) Image Width or 4) Image Height to choose the right TV Lens.
- Choose the 45mm or 50 mm Bracket Adapter according to the diameter of the bracket hole diameter.
- Choose the LED Direct Ring Light Module for the reflective illumination.
- Choose the Coaxial Light Module if coaxial illumination is required.
- Choose the Transmissive Light Module if transmissive illumination is required.
- Choose the Camera Module.

We offer a variety of microscope cameras. Customers could get the detailed information of our cameras on the official website (<http://www.touptek.com/>) and choose the appropriate ones.

The combinations of different the Auxiliary Lens, The Middle Zoom Module and the TV Lens. With this figure, user can configure MZO with different magnification to fit different sensor and different application

Auxiliary Lens-Main Zoom Module-TV Lens	WD(mm)	PMAG	DFOV(mm)	NAO	Camera
TZM0660-W3050-TV3050	174	0.15X-1.5X	40.00-4.00	0.007-0.045	1/3inch
TZM0660-W3075-TV3050	115	0.23X-2.3X	26.67-2.67	0.011-0.068	
TZM0660-W3100-TV3050	86	0.3X-3.0X	20.00-2.00	0.015-0.09	
TZM0660-W3050-TV3075	174	0.23X-2.3X	35.56-3.56	0.007-0.045	1/2inch
TZM0660-W3075-TV3075	115	0.34X-3.4X	23.7-2.37	0.011-0.068	
TZM0660-W3100-TV3075	86	0.45X-4.5X	17.78-1.78	0.015-0.09	
TZM0660-W3050-TV3100	174	0.3X-3.0X	36.67-3.67	0.007-0.045	2/3inch
TZM0660-W3075-TV3100	115	0.45X-4.5X	24.44-2.44	0.011-0.068	
TZM0660-W3100-TV3100	86	0.6X-6.0X	18.33-1.83	0.015-0.09	

6.7.10 TZM0660 MZO's Packing List

The packing information of the TZM0660 MZO is as follows:



Figure 6-49 The TZM0660 main body, including Auxiliary Lens Module, Middle Zoom Module, TV Lens, Camera Adapter Tube and Bracket Adapter

6.7.11 Order List of TZM0660 MZO

6.7.11.1 TZM0660 Function Module Optional Order List

Module	Order number	Quantity	Remarks	Description
Middle Zoom Module	TZM0660			Ordinary Middle Zoom Module
	TZM0660D			Middle Zoom Module with detent
Auxiliary Lens Module	W3050			0.50X Object Lens
	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(American Standard)
	40600015			POWER-E-12V1A(European standard)

6.7.11.2 TZM0660 Monocular Zoom Object Package Order List

Order number		Quantity	Remarks
Package Name	TZM0660□-W3□□□-TV3□□□-A□□		
	TZM0660□-W3□□□-TV3□□□-A□□		
	TZM0660□-W3□□□-TV3□□□-A□□		
	TZM0660□-W3□□□-TV3□□□-A□□		
	TZM0660□-W3□□□-TV3□□□-A□□		
	TZM0660□-W3□□□-TV3□□□-A□□		
	TZM0660□-W3□□□-TV3□□□-A□□		
	TZM0660□-W3□□□-TV3□□□-A□□		
	TZM0660□-W3□□□-TV3□□□-A□□		
	TZM0660□-W3□□□-TV3□□□-A□□		
Remarks			
Remarks: Users or salesmen can directly write the corresponding module name, number of sets, and other special requirements in the remarks with their own professional knowledge.			

6.7.11.3 TZM0660 Order List of Other Accessories

Module	Order number	Quantity	Remarks	Description
	W3050			0.50X Object Lens

The Light Source for TzM0660 MZO

Auxiliary Lens Module	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL-65			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(MSA-C1000IC12.0-12H-US), Power Adapter American Standard
	40600015			POWER-E-12V1A(MSA-C1000IC12.0-12W-DE), Power Adapter European standard

6.8 TZM0640 MZO

6.8.1 The Configuration of TZM0640 MZO with Five Modules

TZM0640 MZO(Monocular Zoom Objective) is an ideal choice for most applications that requires multiple magnifications or for those that prohibits continual manual refocusing. The applications of the **TZM0640 MZO** are: machine vision; small details inspection; industrial inspection especially electronic components; scientific research; medical industry; education industry.

The modular design of **TZM0640 MZO** is showed in below. The design is based on the bilateral parallel light path principle and consists of five basic modules. The five basic modules are: **Middle Zoom Module**, **Auxiliary Lens Module**, **TV Lens Module**, **Bracket Adapter Module** and **Optional Module**(Not show in the figure).

TZM0640 MZO can be combined with **Camera Module** (optional) to form a digital monocular zoom microscope.

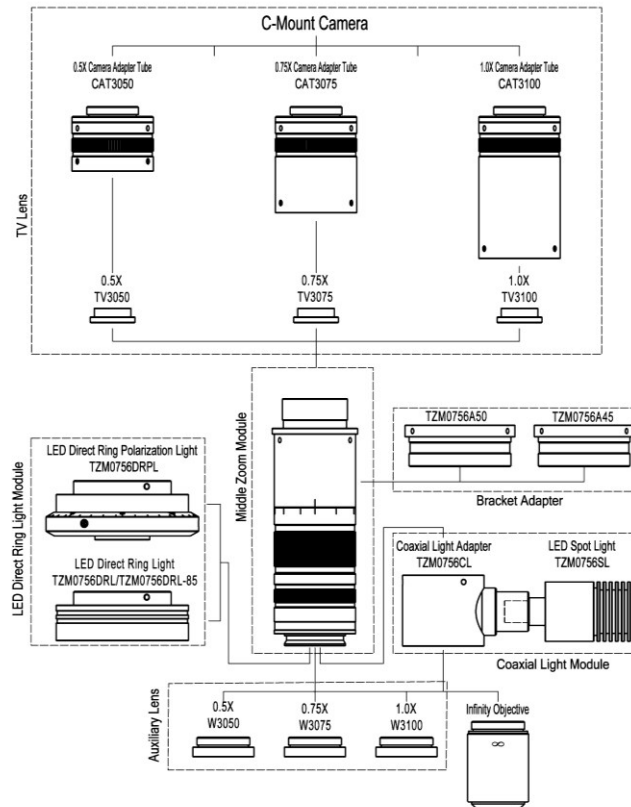


Figure 6-50 The five modules and the TZM0640 MZO

The basic module of **TZM0640 MZO** is **TZM0640-W3100-TV3100-A50**, it has 0.6X-4.0X zoom range and 6.5X zoom ratio. It is a high-quality precision **MZO** that provides high resolution and large depth of field. Its main features are shown below:

- With 0.6X~4.0X zoom range, 6.5X zoom ratio
- Larger NA: 0.015-0.067 (When using 1.00x **Auxiliary Lens**)
- Higher resolution: 18.3um-4.1um (When using 1.00x **Auxiliary Lens**)
- Larger field of view: 2.67mm-40mm (Object plane)
- Larger sensor size: 2/3" (When using 1.00x **TV Lens**)
- Working distance range: 86mm-174mm
- With adjustable BFL, parfocal in zoom range
- With adjustable center, the image center remains unchanged from 4.0x to 0.6x
- Compatible with infinity objectives (both biological and metallographic)
- Compact size: 194 mm (length) × 40 mm (diameter)
- **Auxiliary Lens** with 0.50x, 0.75x, 1.00x magnification (**Optional**)
- **TV Lens** with 0.50x, 0.75x, 1.00x magnification (**Optional**)
- Brightness adjustable **LED Direct Ring Light** (**Optional**)
- Brightness adjustable **LED Direct Ring Polarization Light** (**Optional**)
- Brightness adjustable **LED Coaxial Light** (**Optional**)
- **LED Transmissive Light** (**Optional**)
- 45mm or 50mm **Bracket Adapter** (**Optional**)



Figure 6-51 The TZM0640 MZO with different configuration

6.8.2 TZM0640 MZO's Middle Zoom Module

Order Number	Meaning	TZM0640	Postfix meaning
TZM0640	Ordinary Middle Zoom Module	ZM: Zoom 064: 0.6X~4.0X	NA
TZM0640D	Middle Zoom Module with detent to fix the magnification function		D: Detent

6.8.3 TZM0640 MZO's Auxiliary Lens

Order number	Magnification	Working distance (mm)	Field of View in the object side(TV3050, 1/3"sensor)	
			Lower magnification	Higher magnification
W3050	0.5X	174	60.00mm	3.00mm
W3075	0.75X	115	40.00mm	2.00mm
W3100	1.00X	86	30.00mm	1.50mm

Note: The same **Auxiliary Lens** with different **TV lens** is just used to adapt to different size image sensor, which will not have much impact on the field of view of the **MZO**.

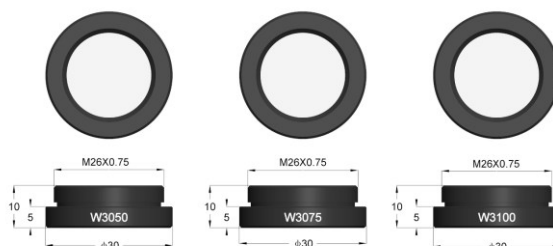


Figure 6-52 The Auxiliary Lens for TZM0640 MZO

6.8.4 TZM0640 MZO's TV Lens

Order number	The maximum compatible sensor size
TV3050	1/3"
TV3075	1/1.8"
TV3100	2/3"

Note: Smaller image sensors can also be used for **TV Lens** with higher magnification, but in this way, the **FOV** of **MZO** will be reduced.

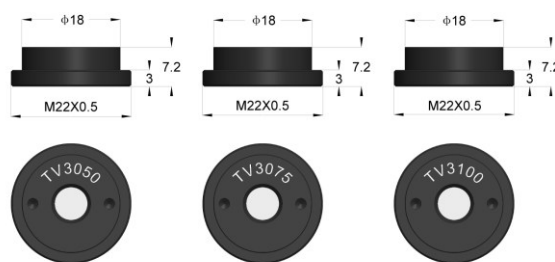


Figure 6-53 TV Lens with different magnification for TZM0640

6.8.5 TZM0640 MZO's Bracket Adapter

The installation method of the **Bracket Adapter** (**TZM0756A45**, **TZM0756A50**) and bracket is shown below.

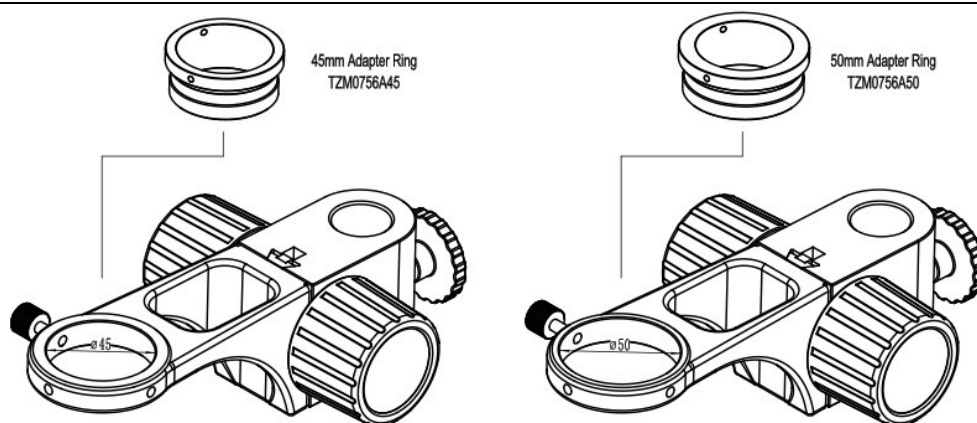


Figure 6-54 TZM0640 MZO's Bracket Adapter

6.8.6 TZM0640 MZO's Optional Module

The **Optional Modules** include **LED Direct Ring Light Module** (including **LED Direct Ring Light Module** and **LED Direct Ring Polarization Light Module**), **Coaxial Light Module** (composed of **Coaxial Light Adapter** and **LED Spot Light**) and **Transmissive Light Module**. The currently possible samples are shown in table below.

Module	Order Number	Description
LED Direct Ring Light Module	TZM0756DRL-65, TZM0756DRL-85	LED Direct Ring Light
	TZM0756DRPL-65	LED Direct Ring Polarization Light
Coaxial Light Module	TZM0756CL+TZM0756SL	Coaxial Light Adapter + LED Spot Light
Transmissive Light Module	TZM0756TL	LED Transmissive Light
Power of Light Source	40600014	US:POWER-U-12V1A(Power Adapter American Standard)
	40600015	DE: POWER-E-12V1A(Power Adapter European standard)

6.8.7 The Optical Specifications of TZM0640 MZO with Different Auxiliary &TV Lens

The optical specifications of TZM0640 MZO with different **Auxiliary Lens** and **TV Lens** are shown in table below. **Auxiliary Lens** and **TV Lens** with 1.00x(TZM0640-W3100-TV3100) are listed in the left-up cell. Its data is the basis of the other parameters in the whole table.

Auxiliary Lens	Specification	TV3100 2/3"(D=11mm)		TV3050 1/3"(D=6mm)		TV3075 1/2"(D=8mm)	
W3100 WD 86mm	PMAG	0.60-4.00		0.30-2.00		0.45-3.00	
	DFOV/mm	18.33	2.75	20.00	3.00	17.78	2.67
	NA	0.015	0.067	0.015	0.067	0.015	0.067
W3050 WD 174mm	PMAG	0.30-2.00		0.15-1.00		0.23-1.50	
	DFOV/mm	36.67	5.50	40.00	6.00	35.56	5.33
	NA	0.007	0.033	0.007	0.033	0.007	0.033
W3075 WD 115mm	PMAG	0.45-3.00		0.23-1.50		0.34-2.25	
	DFOV/mm	24.44	3.67	26.67	4.00	23.70	3.56
	NA	0.011	0.050	0.011	0.050	0.011	0.050

WD: Working Distance; **PMAG:** Primary Magnification; **DFOV:** Diagonal Field of View in the object side; **NA:** Numerical Aperture;

Note: Infinity corrected objectives limit system's usable zoom range due to uneven illumination. The maximum sensor size is 2/3".

6.8.8 The Dimension of TZM0640 MZO with Different Light Module

The dimension of TZM0640 series MZO with different **Auxiliary Lens** and **TV Lens** is shown below:

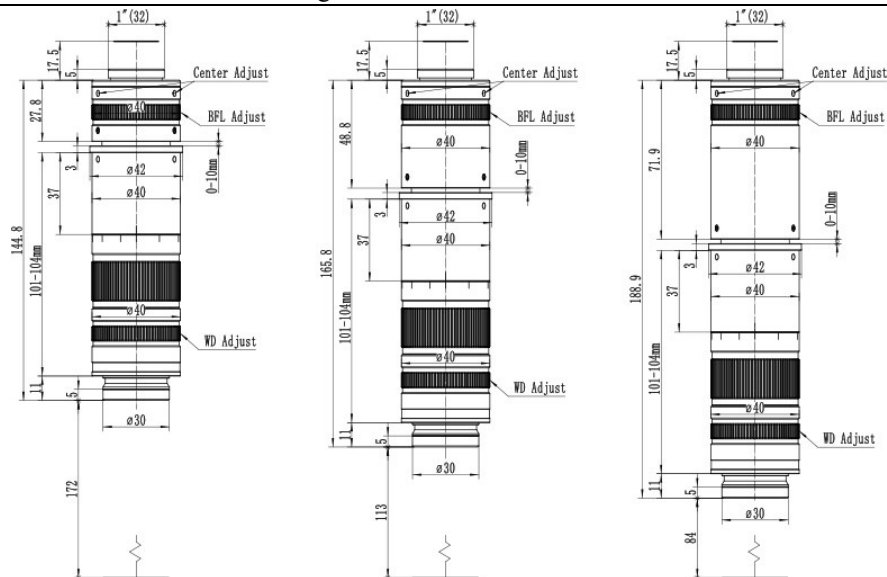


Figure 6-55 Dimension of TZM0640 series MZO with different Auxiliary Lens and TV Lens
a) TZM0640-W3050-TV3050; b) TZM0640-W3075-TV3075 c) TZM0640-W3100-TV3100

The length of the MZO with different TV Lens will be slightly different. The length of TZM0640-W3050-TV3050 is 144.8mm, it is much shorter than most of the MZO in the market.

6.8.9 How to Configure TZM0640 MZO

The corresponding parameters of TZM0640 MZO are listed in below. A specific combination can be determined according to the following steps.

- Confirm the possible range of 1) DFOV and 2) Working Distance in the object space to choose the Auxiliary Lens.
- Choose the M26x0.705 to M20x0.705 Objective Adapter, if the M20x0.705 mount infinity objective is used.
- Confirm the camera Image Area Size, it can be 1) Sensor Size (1/x in inch), 2) Image Diagonal Length, 3) Image Width or 4) Image Height to choose the right TV Lens.
- Choose the 45mm or 50 mm Bracket Adapter according to the diameter of the bracket hole diameter.
- Choose the LED Direct Ring Light Module for the reflective illumination.
- Choose the Coaxial Light Module if coaxial illumination is required.
- Choose the Transmissive Light Module if transmissive illumination is required.
- Choose the Camera Module.

We offer a variety of microscope cameras. Customers could get the detailed information of our cameras on the official website (<http://www.touptek.com/>) and choose the appropriate ones.

The combinations of different the Auxiliary Lens, The Middle Zoom Module and the TV Lens. With this figure, user can configure MZO with different magnification to fit different sensor and different application

Auxiliary Lens-Main Zoom Module-TV Lens	WD(mm)	PMAG	DFOV(mm)	NAO	Camera
TZM0640-W3050-TV3050	174	0.15X-1.0X	40.00-6.00	0.007-0.033	1/3inch
TZM0640-W3075-TV3050	115	0.23X-1.5X	26.67-4.00	0.011-0.050	
TZM0640-W3100-TV3050	86	0.3X-2.0X	20.00-3.00	0.015-0.067	
TZM0640-W3050-TV3075	174	0.23X-1.5X	35.56-5.33	0.007-0.033	1/2inch
TZM0640-W3075-TV3075	115	0.34X-2.25X	23.7-3.56	0.011-0.050	
TZM0640-W3100-TV3075	86	0.45X-3.00X	17.78-2.67	0.015-0.067	
TZM0640-W3050-TV3100	174	0.3X-2.0X	36.67-5.50	0.007-0.033	2/3inch
TZM0640-W3075-TV3100	115	0.45X-3.00X	24.44-3.67	0.011-0.050	
TZM0640-W3100-TV3100	86	0.6X-4.0X	18.33-2.75	0.015-0.067	

6.8.10 TZM0640 MZO's Packing List

The packing information of the TZM0640 MZO is as follows:



Figure 6-56 The TzM0640 main body, including Auxiliary Lens Module, Middle Zoom Module, TV Lens, Camera Adapter Tube and Bracket Adapter

6.8.11 Order List of TzM0640 MZO

6.8.11.1 TzM0640 Function Module Optional Order List

Module	Order number	Quantity	Remarks	Description
Middle Zoom Module	TzM0640			Ordinary Middle Zoom Module
	TzM0640D			Middle Zoom Module with detent
Auxiliary Lens Module	W3050			0.50X Object Lens
	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TzM0756CL+TzM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TzM0756DRL-65			LED Direct Ring Light
	TzM0756DRL-85			LED Direct Ring Light
	TzM0756DRPL			LED Direct Ring Polarization Light
Transmissive Light Module	TzM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(American Standard)
	40600015			POWER-E-12V1A(European standard)

6.8.11.2 TzM0640 Monocular Zoom Object Package Order List

Order number		Quantity	Remarks
Package Name	TzM0640□-W3□□□-TV3□□□-A□□		
	TzM0640□-W3□□□-TV3□□□-A□□		
	TzM0640□-W3□□□-TV3□□□-A□□		
	TzM0640□-W3□□□-TV3□□□-A□□		
	TzM0640□-W3□□□-TV3□□□-A□□		
	TzM0640□-W3□□□-TV3□□□-A□□		
	TzM0640□-W3□□□-TV3□□□-A□□		
	TzM0640□-W3□□□-TV3□□□-A□□		
	TzM0640□-W3□□□-TV3□□□-A□□		
	TzM0640□-W3□□□-TV3□□□-A□□		
Remarks			
Remarks: Users or salesmen can directly write the corresponding module name, number of sets, and other special requirements in the remarks with their own professional knowledge.			

6.8.11.3 TzM0640 Order List of Other Accessories

Module	Order number	Quantity	Remarks	Description
	W3050			0.50X Object Lens

The Light Source for TZM0640 MZO

Auxiliary Lens Module	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL-65			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(MSA-C1000IC12.0-12H-US), Power Adapter American Standard
	40600015			POWER-E-12V1A(MSA-C1000IC12.0-12W-DE), Power Adapter European standard

6.9 TZM0880 MZO

6.9.1 The Configuration of TZM0880 MZO with Five Modules

TZM0880 MZO(Monocular Zoom Objective) is an ideal choice for most applications that requires multiple magnifications or for those that prohibits continual manual refocusing. The applications of the **TZM0880 MZO** are: machine vision; small details inspection; industrial inspection especially electronic components; scientific research; medical industry; education industry.

The modular design of **TZM0880 MZO** is showed in below. The design is based on the bilateral parallel light path principle and consists of five basic modules are: **Middle Zoom Module**, **Auxiliary Lens Module**, **TV Lens Module**, **Bracket Adapter Module** and **Optional Module**(Not show in the figure).

TZM0880 MZO can be combined with **Camera Module** (optional) to form a digital monocular zoom microscope.

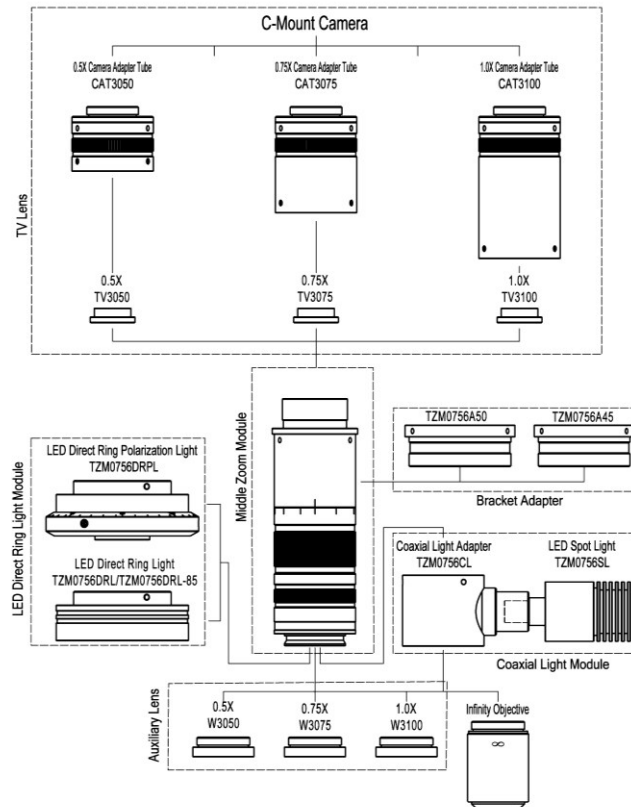


Figure 6-57 The five modules and the TZM0880 MZO

The basic module of **TZM0880 MZO** is **TZM0880-W3100-TV3100-A50**, it has 0.8X-8.0X zoom range and 10X zoom ratio. It is a high-quality precision **MZO** that provides high resolution and large depth of field. Its main features are shown below:

- With 0.8X~8.0X zoom range, 10X zoom ratio
- Larger NA: 0.02-0.11 (When using 1.00x **Auxiliary Lens**)
- Higher resolution: 15.3mm-2.45mm (When using 1.00x **Auxiliary Lens**)
- Larger field of view: 1.33mm-30mm (Object plane)
- Larger sensor size: 2/3" (When using 1.00x **TV Lens**)
- Working distance range: 86mm-174mm
- With adjustable BFL, parfocal in zoom range
- With adjustable center, the image center remains unchanged from 8.0x to 0.8x
- Compatible with infinity objectives (both biological and metallographic)
- Compact size: 194 mm (length) × 40 mm (diameter)
- **Auxiliary Lens** with 0.50x, 0.75x, 1.00x magnification (**Optional**)
- **TV Lens** with 0.50x, 0.75x, 1.00x magnification (**Optional**)
- Brightness adjustable **LED Direct Ring Light** (**Optional**)
- Brightness adjustable **LED Direct Ring Polarization Light** (**Optional**)
- Brightness adjustable **LED Coaxial Light** (**Optional**)
- **LED Transmissive Light** (**Optional**)
- 45mm or 50mm **Bracket Adapter** (**Optional**)



Figure 6-58 The TZM0880 MZO with different configuration

6.9.2 TZM0880 MZO's Middle Zoom Module

Order Number	Meaning	TZM0880	Postfix meaning
TZM0880	Ordinary Middle Zoom Module	ZM: Zoom 0880: 0.8X~8.0X	NA
TZM0880D	Middle Zoom Module with detent to fix the magnification function		D: Detent

6.9.3 TZM0880 MZO's Auxiliary Lens

Order number	Magnification	Working distance (mm)	Field of View in the object side(TV3050, 1/3"sensor)	
			Lower magnification	Higher magnification
W3050	0.5X	174	60.00mm	3.00mm
W3075	0.75X	115	40.00mm	2.00mm
W3100	1.00X	86	30.00mm	1.50mm

Note: The same **Auxiliary Lens** with different **TV lens** is just used to adapt to different size image sensor, which will not have much impact on the field of view of the **MZO**.

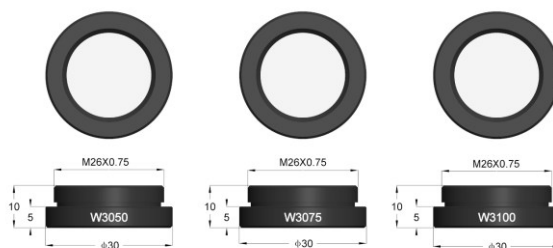


Figure 6-59 The Auxiliary Lens for TZM0880 MZO

6.9.4 TZM0880 MZO's TV Lens

Order number	The maximum compatible sensor size
TV3050	1/3"
TV3075	1/1.8"
TV3100	2/3"

Note: Smaller image sensors can also be used for **TV Lens** with higher magnification, but in this way, the **FOV** of **MZO** will be reduced.

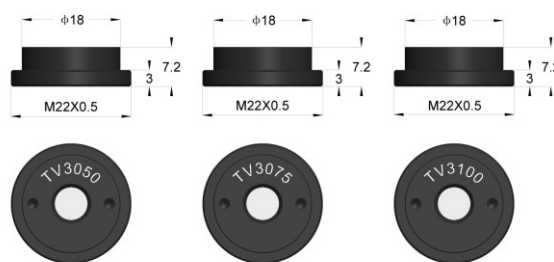


Figure 6-60 TV Lens with different magnification for TZM0880

6.9.5 TZM0880 MZO's Bracket Adapter

The installation method of the **Bracket Adapter** (TZM0756A45, TZM0756A50) and bracket is shown below.

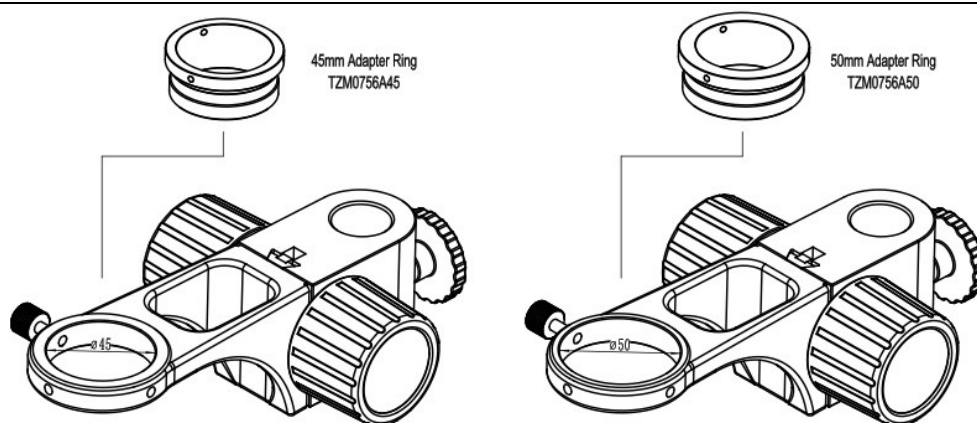


Figure 6-61 TZM0880 MZO's Bracket Adapter

6.9.6 TZM0880 MZO's Optional Module

The **Optional Modules** include **LED Direct Ring Light Module** (including **LED Direct Ring Light Module** and **LED Direct Ring Polarization Light Module**), **Coaxial Light Module** (composed of **Coaxial Light Adapter** and **LED Spot Light**) and **Transmissive Light Module**. The currently possible samples are shown in table below.

Module	Order Number	Description
LED Direct Ring Light Module	TZM0756DRL-65, TZM0756DRL-85	LED Direct Ring Light
	TZM0756DRPL-65	LED Direct Ring Polarization Light
Coaxial Light Module	TZM0756CL+TZM0756SL	Coaxial Light Adapter + LED Spot Light
Transmissive Light Module	TZM0756TL	LED Transmissive Light
Power of Light Source	40600014	US:POWER-U-12V1A(Power Adapter American Standard)
	40600015	DE: POWER-E-12V1A(Power Adapter European standard)

6.9.7 The Optical Specifications of TZM0880 MZO with Different Auxiliary &TV Lens

The optical specifications of TZM0880 MZO with different **Auxiliary Lens** and **TV Lens** are shown in table below. **Auxiliary Lens** and **TV Lens** with 1.00x(TZM0880-W3100-TV3100) are listed in the left-up cell. Its data is the basis of the other parameters in the whole table.

Auxiliary Lens	Specification	TV3100 2/3"(D=11mm)		TV3050 1/3"(D=6mm)		TV3075 1/2"(D=8mm)	
W3100 WD 86mm	PMAG	0.80-8.00		0.40-4.00		0.60-6.00	
	DFOV/mm	13.75	1.38	15.00	1.50	13.33	1.33
	NA	0.018	0.112	0.018	0.112	0.018	0.112
W3050 WD 174mm	PMAG	0.40-4.00		0.20-2.00		0.30-3.00	
	DFOV/mm	27.50	2.75	30.00	3.00	26.67	2.67
	NA	0.010	0.056	0.010	0.056	0.010	0.056
W3075 WD 115mm	PMAG	0.60-6.00		0.30-3.00		0.45-4.50	
	DFOV/mm	18.33	1.83	20.00	2.00	17.78	1.78
	NA	0.014	0.084	0.014	0.084	0.014	0.084

WD: Working Distance; **PMAG:** Primary Magnification; **DFOV:** Diagonal Field of View in the object side; **NA:** Numerical Aperture;

Note: Infinity corrected objectives limit system's usable zoom range due to uneven illumination. The maximum sensor size is 2/3".

6.9.8 The Dimension of TZM0880 MZO with Different Light Module

The dimension of TZM0880 series MZO with different **Auxiliary Lens** and **TV Lens** is shown below:

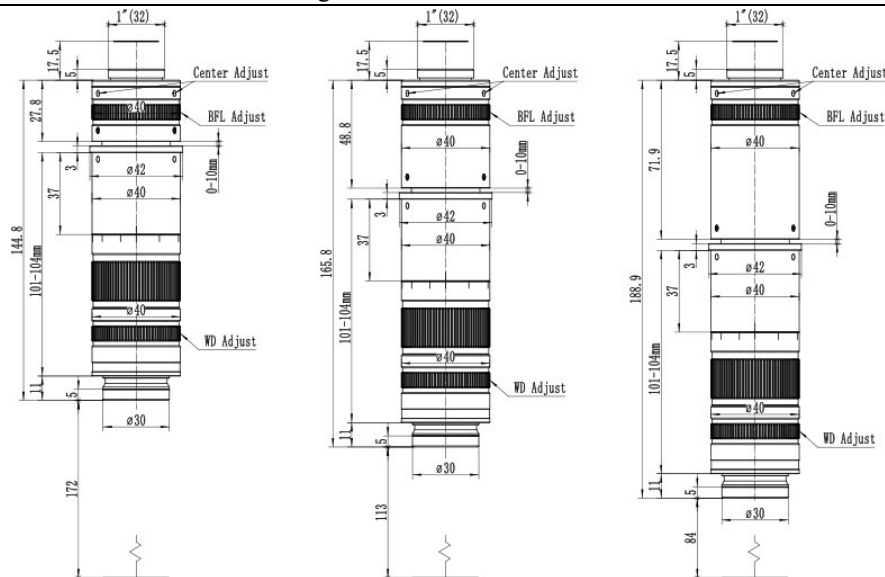


Figure 6-62 Dimension of TZM0880 series MZO with different Auxiliary Lens and TV Lens
a) TZM0880-W3050-TV3050; b) TZM0880-W3075-TV3075 c) TZM0880-W3100-TV3100

The length of the MZO with different TV Lens will be slightly different. The length of TZM0880-W3050-TV3050 is 144.8mm, it is much shorter than most of the MZO in the market.

6.9.9 How to Configure TZM0880 MZO

The corresponding parameters of TZM0880 MZO are listed in below. A specific combination can be determined according to the following steps.

- Confirm the possible range of 1) DFOV and 2) Working Distance in the object space to choose the Auxiliary Lens.
- Choose the M26x0.705 to M20x0.705 Objective Adapter, if the M20x0.705 mount infinity objective is used.
- Confirm the camera Image Area Size, it can be 1) Sensor Size (1/x in inch), 2) Image Diagonal Length, 3) Image Width or 4) Image Height to choose the right TV Lens.
- Choose the 45mm or 50 mm Bracket Adapter according to the diameter of the bracket hole diameter.
- Choose the LED Direct Ring Light Module for the reflective illumination.
- Choose the Coaxial Light Module if coaxial illumination is required.
- Choose the Transmissive Light Module if transmissive illumination is required.
- Choose the Camera Module.

We offer a variety of microscope cameras. Customers could get the detailed information of our cameras on the official website (<http://www.touptek.com/>) and choose the appropriate ones.

The combinations of different the Auxiliary Lens, The Middle Zoom Module and the TV Lens. With this figure, user can configure MZO with different magnification to fit different sensor and different application

Auxiliary Lens-Main Zoom Module-TV Lens	WD(mm)	PMAG	DFOV(mm)	NAO	Camera
TZM0880-W3050-TV3050	174	0.2X-2.0X	30.00-3.00	0.01-0.056	1/3inch
TZM0880-W3075-TV3050	115	0.3X-3.0X	20.00-2.00	0.014-0.084	
TZM0880-W3100-TV3050	86	0.4X-4.0X	15.00-1.50	0.018-0.112	
TZM0880-W3050-TV3075	174	0.3X-3.0X	26.67-2.67	0.01-0.056	1/2inch
TZM0880-W3075-TV3075	115	0.45X-4.5X	17.78-1.78	0.014-0.084	
TZM0880-W3100-TV3075	86	0.6X-6.0X	13.33-1.33	0.018-0.112	
TZM0880-W3050-TV3100	174	0.4X-4.0X	27.5-2.75	0.01-0.056	2/3inch
TZM0880-W3075-TV3100	115	0.6X-6.0X	18.33-1.83	0.014-0.084	
TZM0880-W3100-TV3100	86	0.8X-8.0X	13.75-1.38	0.018-0.112	

6.9.10 TZM0880 MZO's Packing List

The packing information of the TZM0880 MZO is as follows:



Figure 6-63 The TzM0880 main body, including Auxiliary Lens Module, Middle Zoom Module, TV Lens, Camera Adapter Tube and Bracket Adapter

6.9.11 Order List of TzM0880 MZO

6.9.11.1 TzM0880 Function Module Optional Order List

Module	Order number	Quantity	Remarks	Description
Middle Zoom Module	TzM0880			Ordinary Middle Zoom Module
	TzM0880D			Middle Zoom Module with detent
Auxiliary Lens Module	W3050			0.50X Object Lens
	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TzM0756CL+TzM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TzM0756DRL-65			LED Direct Ring Light
	TzM0756DRL-85			LED Direct Ring Light
	TzM0756DRPL			LED Direct Ring Polarization Light
Transmissive Light Module	TzM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(American Standard)
	40600015			POWER-E-12V1A(European standard)

6.9.11.2 TzM0880 Monocular Zoom Object Package Order List

Order number		Quantity	Remarks
Package Name	TzM0880□-W3□□□-TV3□□□-A□□		
	TzM0880□-W3□□□-TV3□□□-A□□		
	TzM0880□-W3□□□-TV3□□□-A□□		
	TzM0880□-W3□□□-TV3□□□-A□□		
	TzM0880□-W3□□□-TV3□□□-A□□		
	TzM0880□-W3□□□-TV3□□□-A□□		
	TzM0880□-W3□□□-TV3□□□-A□□		
	TzM0880□-W3□□□-TV3□□□-A□□		
	TzM0880□-W3□□□-TV3□□□-A□□		
	TzM0880□-W3□□□-TV3□□□-A□□		
Remarks			
Remarks: Users or salesmen can directly write the corresponding module name, number of sets, and other special requirements in the remarks with their own professional knowledge.			

6.9.11.3 TzM0880 Order List of Other Accessories

Module	Order number	Quantity	Remarks	Description
	W3050			0.50X Object Lens

The Light Source for TzM0880 MZO

Auxiliary Lens Module	W3075			0.75X Object Lens
	W3100			1.0X Object Lens
	ON-XX			Biological Objective
	ON-YY			Metallographic Objective
	Objective Adapter			M26x0.706 to M20x0.706
TV Lens	TV3050			For 1/3" Sensor
	TV3075			For 1/1.8" Sensor
	TV3100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter
	A50			50mm Bracket Adapter
Coaxial Light Module	TZM0756CL+TZM0756SL			Coaxial Light Adapter + LED Spot Light
LED Direct Ring Light Module	TZM0756DRL-65			LED Direct Ring Light
	TZM0756DRL-85			LED Direct Ring Light
	TZM0756DRPL-65			LED Direct Ring Polarization Light
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(MSA-C1000IC12.0-12H-US), Power Adapter American Standard
	40600015			POWER-E-12V1A(MSA-C1000IC12.0-12W-DE), Power Adapter European standard

7 Microscope Stands

7.1 Stand for MZO / AFDM

7.1.1 Bracket for Stand

At present, there are three kinds of bracket available, and users can choose one of them, and then combine it with the base to form their own microscope stand for the monocular zoom microscope. The parameters of the three brackets are listed below

Model	Column Aperture (mm)	Lens Aperture (mm)	Center Distance (mm)	Adjustment Range (mm)	Picture
A1	25	76	150	50	
A4	25	50	140	62	
A5	32	50	150	36	
A20	25	50	165	62	
CFA5025	25	50	150	62	



Figure 7-1 A 1 bracket



Figure 7-2 A4 bracket



Figure 7-3 A5 bracket

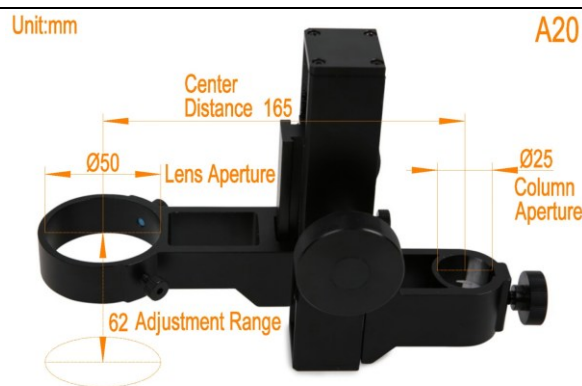


Figure 7-4 A20 bracket



Figure 7-5 CFA5025 bracket with coarse fine adjustment knob

7.1.2 Base for Stand

At present, there are five kinds of bases to choose, and the user can choose one of them, and then combine it with the bracket to form his own microscope stand for monocular microscope. The parameters of the five bases are listed below. The base with B in the table is only obtained by rotating base with A by 90 degrees.

Model	Base (L x W x H mm)	Column Height(mm)	Column Diameter(mm)
B10	380×248×23	340	25
B11A	320×260×19	295	32
B11B	260×320×19	295	32
B20A	375×250×20	335	25
B20B	250×375×20	335	25
B210			NA

7.1.3 Microscope Stand

- The bracket can be freely matched with the base
- Easy large-sized focusing knobs on both sides of focusing holder
- Steel gears on focusing holder.
- Standard size focusing holder - will fit scope heads with diameter of 50mm
- Different size of base
- Suitable for monocular zoom microscope

Model	Bracket	Base
TPS-10A	A4	B10
TPS-20A	A5	B11A
TPS-20B	A5	B11B
TPS-30A	A1	B10
TPS-300A	CFA5025	B10
TPS-200A	A20	B20A
TPS-200B	A20	B20B
TPS-210A50	A50	B210
TPS-210A76	A76	B210

Unit:mm

TPS-10A



Figure 7-6 TPS-10A



Figure 7-7 TzM0756 monocular zoom microscope, HDMI camera and TPS-10A

Unit:mm

TPS-20A



Figure 7-8 TPS-20A. TPS-20B can be obtained by rotating base B11A 90 degrees(B11B) and assembling it with bracket A5



Figure 7-9 TzM0756 monocular zoom microscope, HDMI camera and TPS-20A



Figure 7-10 TPS-30A(A1+B10)



Figure 7-11 AFDM101 auto-focus digital microscope +TPS30A

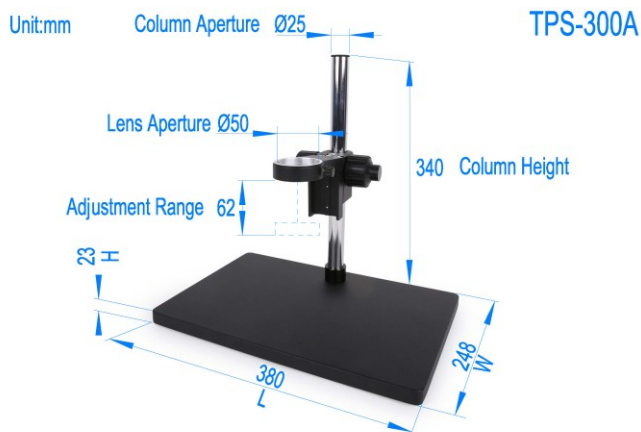


Figure 7-12 TPS-300A(CFA5025+B10)



Figure 7-13 TPS300A+TzM0480+USB Camera



Figure 7-14 TPS-200A. TPS-200B can be obtained by rotating base B20A 90 degrees(B20B) and assembling it with bracket A20



Figure 7-15 TzM0756 monocular zoom microscope, HDMI camera and TPS-200A

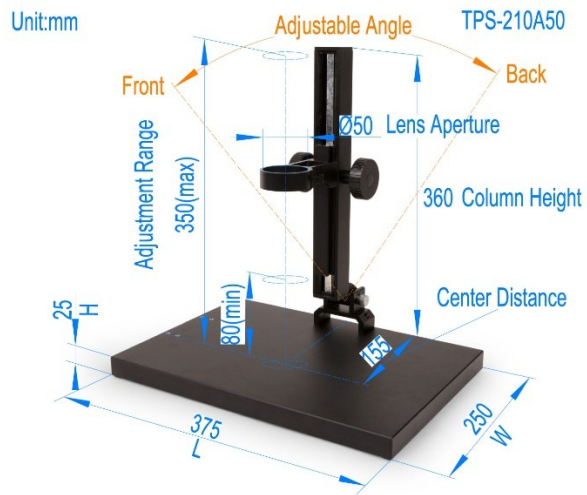


Figure 7-16 TPS-210A50



Figure 7-17 TPS-210A50-G+ZM0480H1080PA+SCR

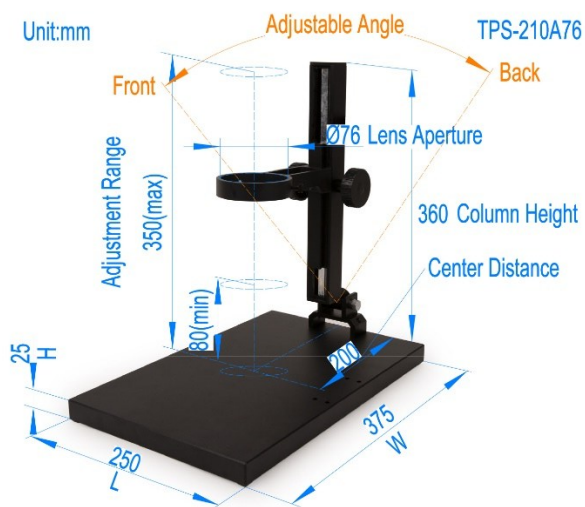


Figure 7-18 TPS-210A76-G1



Figure 7-19 TPS-210A76-G+AFDM101
+DRL-5076A-NPC+SCR

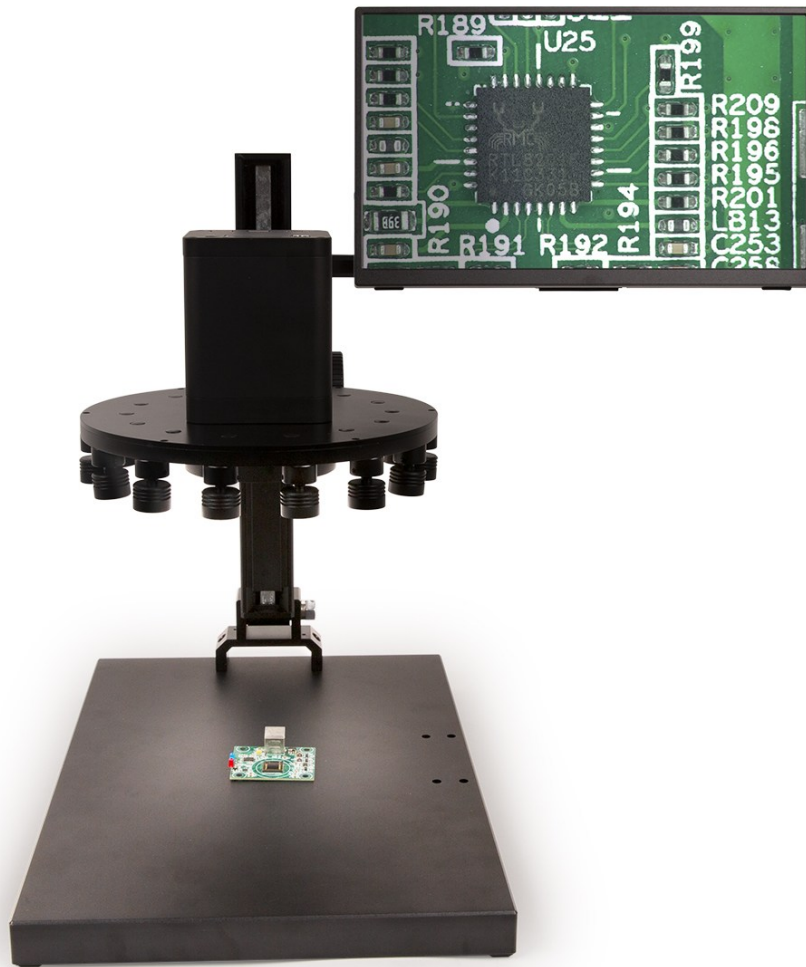


Figure 7-20 TPS-210A76-G+AFDM101+AALRL-200-7650+SCR

7.2 TPS-600 Series Stand with Different Bracket

Model	Bracket	Base
TPS-600-CFA50 TPS-600-CFA50-G	CFA50(focusing with Course and Fine knobs and 50mm Adapter)	TPS-600(380*250*10mm)
TPS-600-CFA76 TPS-600-CFA76-G	CFA76(focusing with Course and Fine knobs and 76mm Adapter))	TPS-600(380*250*10mm)
TPS-600-CFAMF TPS-600-CFAMF-G	CFAMF(focusing with Course and Fine knobs and Multi- Function Adapter))	TPS-600(380*250*10mm)
TPS-600B-CFA50	CFA50(focusing with Course and Fine knobs and 50mm Adapter)	TPS-600B(160*250*10mm)

G: Stand with cross bar



Figure 7-21

图 7-1 CFA50, CFA76, CFAMF brackets with different adapters



Figure 7-22 TPS-600-CFA50



Figure 7-23 TPS-600-CFA50-G(with cross bar)



Figure 7-24 TPS-600-CFA76(with cross bar)



Figure 7-25 TPS-600-CFA76-G(with cross bar)



Figure 7-26 TPS-600-CFAMF



Figure 7-27 TPS-600-CFAMF-G(with cross bar)



Figure 7-28 TPS-600B-CFA50

8 ToupTek®-- Contact Information

	杭州图谱光电科技有限公司	
	杭州市西湖区西园五路 6 号奥强大厦 1 号楼 15 层	
	杭州, 310030, 浙江,	
	中国	
	Hangzhou ToupTek Photonics Co., Ltd	
	15F, Aoqiang Building 1, No. 6, Xiyuan 5th Rd.,	
	Hangzhou, 310030, Zhejiang,	
	+86-571-8111-0735	
	+86-571-8111-0730	
	+86-571-8810-2638,	
	+86-18058780750 (手机/Mobile Phone)	
	FAX: +86-571-8668-3738	
	tphz@touptek.com	
	Skype:	18058780750/ToupTek Photonics
	Q Q	2426878316
	Wechat	18058780750

9 ToupTek Web

9.1 Microscopic Web

Chinese: <https://www.touptekphotonics.com.cn>

English: <https://www.touptek.com>

English: <https://www.touptekphotonics.com>

9.2 Astronomy Web

Chinese: <https://www.touptek-astro.com.cn>

Chinese: <https://www.touptek-astro.cn>

English: <https://www.touptek-astro.com>

9.3 Astronomy independent station/shop

English: <https://www.touptekastro.com>