

## TZM0745B Series Monocular Zoom Objective (MZO)



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# 1 The Structure and Characteristic of TZM0745B Series MZO

## 1.1 The Application of TZM0745B Series MZO

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



Figure 1 TZM0745B with different configuration

## 1.2 The Nomenclature of TZM0745B Series MZO

TZM0756B series MZO needs optional Bracket Adapter for mounting and LED Direct Ring Light for illumination as shown in Figure 2.

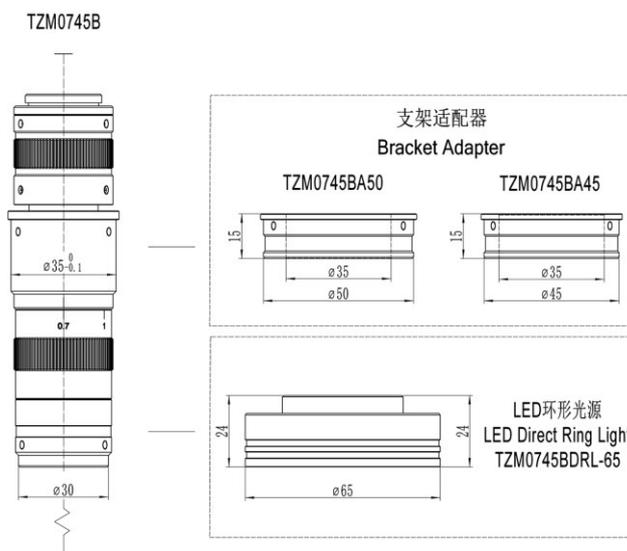


Figure 2 The optional module of TZM0745B

The modular design of TZM0745B series MZO is showed in Figure 8. The design is based on the finite optical system path principle and consists of three basic modules. The three basic modules

are: [Middle Zoom Module](#)(Including the preconfigured [Auxiliary Lens](#), [TV Lens](#)), [Bracket Adapter Module](#) and [Optional Module](#).

In order to configure the [TZM0745B](#) series MZO, we name [TZM0745B](#) series products with a series module code, which is a combination of code of different modules and connected with crossbar “-” as shown in the following example:

[TZM0745Baa-W2bbb-TV2ccc-Add](#)

In the above expression, [aa](#) represents [Middle Zoom Module](#) type, [2](#) is the series number, [bbb](#) represents the magnification of [Auxiliary Lens](#), [ccc](#) represents the magnification of [TV Lens](#), and [dd](#) represents the diameter of [Bracket Adapter](#). With this paradigm, user can understand the meaning and function at a glance. For example, if a MZO is composed of [Middle Zoom Module TZM0745B](#), [Auxiliary Lens W2100](#)(1.00x), [TV Lens TV2050](#)(0.5x) and 50mm [Bracket Adapter A50](#), the final MZO can be expressed as:

[TZM0745B-W2100-TV2050-A50](#)

Currently available [TZM0745Baa](#):[TZM0745B](#);

Currently available [W2bbb](#): [W2075](#) and [W2100](#);

Currently available [TV2ccc](#): [TV2050](#)and [TV2075](#);

Currently available [Add](#): [A50](#) and [A45](#);

Current available [Optional Module](#): [TZM0745BDRL-65](#) and [TZM0756TL](#).

The other [Auxiliary Lens](#) with [b.bb](#) magnification, [TV Lens](#) with [c.cc](#) magnification and [Bracket Adapter](#) with [dd mm](#) size can be customized according to the requirements.

### 1.3 The Product List of TZM0745B Series MZO

[TZM0745B](#) series MZO use finite optical system. There are four models for [TZM0745B](#), they are [TZM0745B-W2100-TV2075](#), [TZM0745B-W2100-TV2050](#), [TZM0745B-W2075-TV2075](#) and [TZM0745B-W2075-TV2050](#) which are the combination of [TZM0745B](#) main body, [Auxiliary Lenses](#) and [TV Lenses](#) with different magnification.

For example: [TZM0745B-W2100-TV2050](#). It represents the magnification of main body is between 0.7X and 4.5X, the magnification of the [Auxiliary Lens](#) is 1.0X and the magnification of [TV Lens](#) is 0.5X. The corresponding parameters are listed in Table 1.

Table 1 Specification of TZM0756B series MZO

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

### 1.3.1 The Optional Module of TZM0745B: Auxiliary Lens

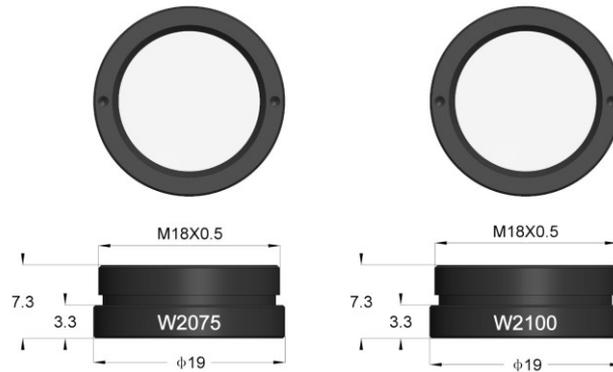


Figure 3 Auxiliary Lens with different magnification for TZM0745B

### 1.3.2 The Optional Module of TZM0745B: TV Lens

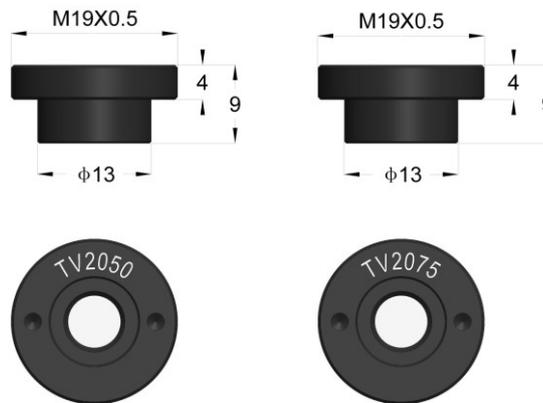


Figure 4 TV Lens with different magnification for TZM0745B

### 1.3.1 The Optional Module of TZM0745B: TZM0745BDRL-65 LED Direct Ring Light and TZM0756TL Transmissive Light

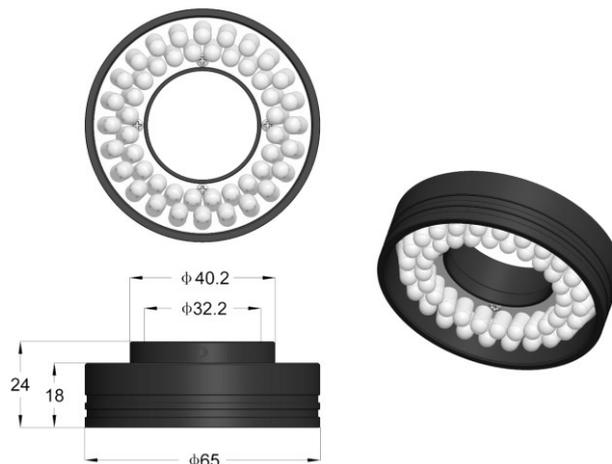


Figure 5 TZM0745BDRL-65, the maximum diameter of LED reaches 65mm, and the diameter of 32.2mm in the center can be directly sleeved to the front end of the corresponding MZO to achieve uniform reflection lighting

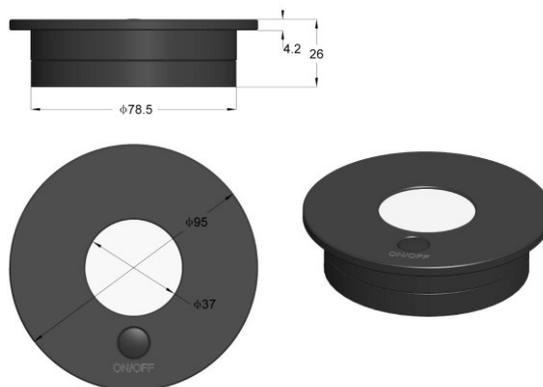


Figure 6 TZM0756TL LED Transmission Light source with illumination range of 37mm

## 1.4 The Basic Characteristics of the TZM0745B Series MZO

The basic module of TZM0745B series 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)

## 1.5 The Connection of TZM0745B Series MZO and Camera



Figure 7 TZM0745B-W2100-TV2075+TZM0745BDRL (LED Direct Ring Light Module)+  
HDMI camera XCAMLite1080PA(Circular)+TPS-20A+SCRN

## 1.6 The Dimension of TZM0745B Series MZO

The dimension of TZM0745B series MZO is showed in Figure 8.

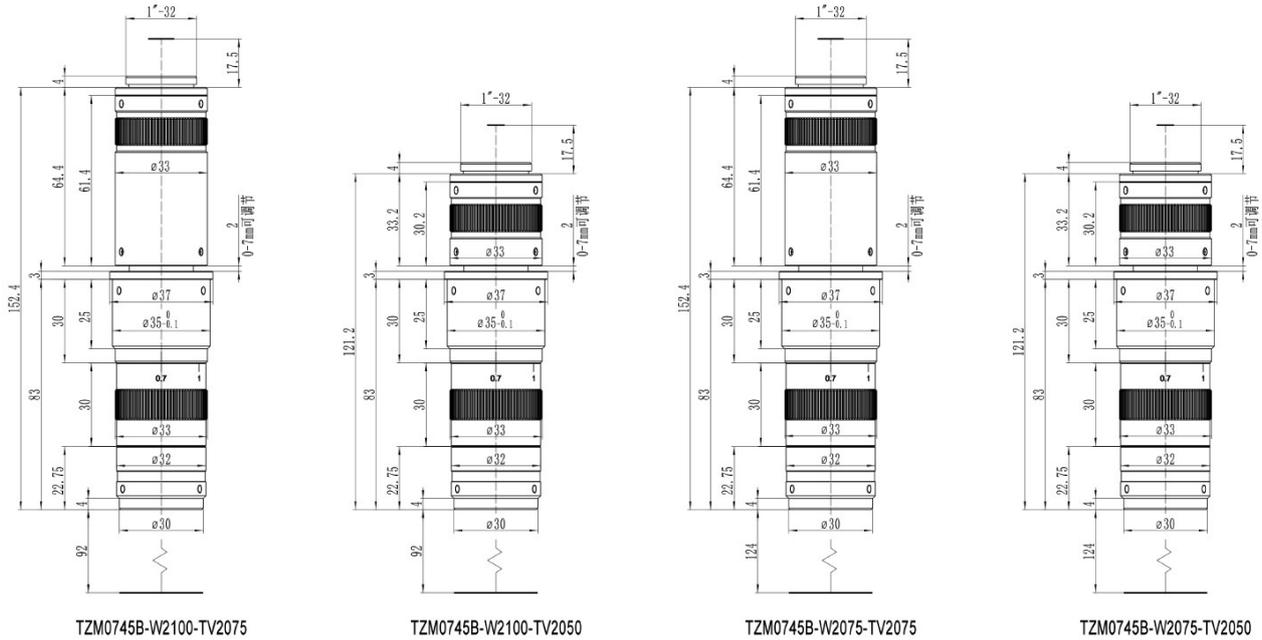


Figure 8 The dimension of TZM0745B series MZO

## 2 Pictures Taken by TZM0745B Series MZO under Different Light Illuminations

Figure 9 are pictures of PCB taken with TZM0745B-W2075-TV2075 under left) 0.7X; right) 2.5X.

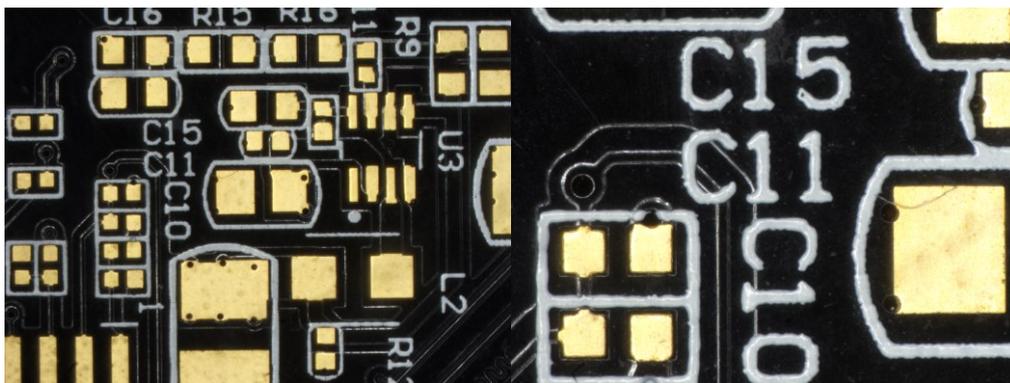


Figure 9 From left to right, there are three pictures of PCB taken under left)0.7X; right) 2.5X



Figure 10 Pictures of Mask taken with TZM0745B-W2075-TV2075 under left)0.7X; middle)2.5X; right)4.5X

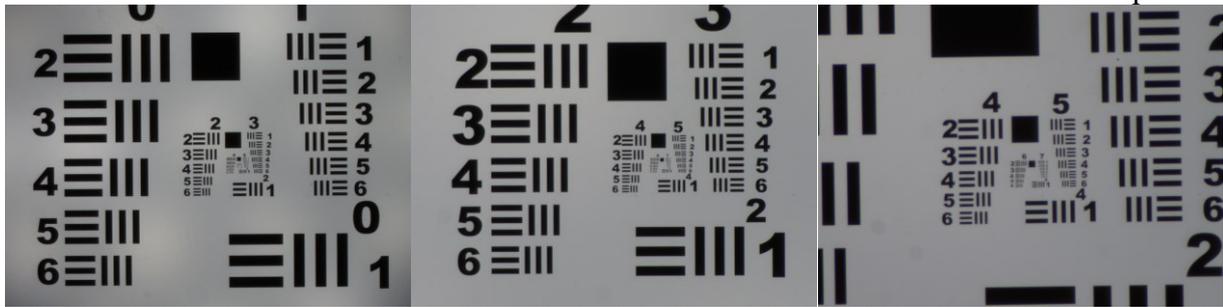


Figure 11 Resolution Plate taken by TZM0745B-W2075-TV2075, under left)0.7X; middle)2.5X; right)4.5X

### 3 TZM0745B Series MZO Packing List

#### 3.1 The Main Body

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



Figure 12 The TZM0745B main body (Can be TZM0745B-W2100-TV2050, TZM0745B-W2100-TV2075, TZM0745B-W2075-TV2050 or TZM0745B-W2075-TV2075) and Bracket Adapter

#### 3.2 The Optional Modules of TZM0745B Series MZO

The [Optional Modules](#) are [LED Direct Ring Light Module](#) and [Transmissive Light Module](#). The [LED Direct Ring Light Module](#) consists of 48 LEDs, Max 1.056A, 22mA Per LED, power Max 3W. The packing information of [TZM0745BDRL-65](#) is as follows:



Figure 13 TZM0745BDRL-65, including LED Direct Ring Light and Power Adapter

Table 2 The light source module for TZM0745B

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)

## 4 Order List of TZM0745B Series MZO

Table 3 TZM0745B Series Monocular Zoom Object Package Order List

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

Table 4 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-C1000IC12.0-12H-US), Power Adapter American Standard
	40600015			POWER-E-12V1A(MSA-C10001C12.0-12W-DE), Power Adapter European Standard

## 5 Service

For customers who purchase the MZO from local dealer, please contact your dealer for more information.

For technical support, please contact e-mail address: [tphz@touptek.com](mailto:tphz@touptek.com)