

TZM015120 Series 0.15-1.20X Monocular Zoom Objective (MZO)



Contents

1 The Basic Characteristic of TzM015120 Series MZO.....	2
1.1 Introduction of TzM015120 Series MZO.....	2
1.2 The Basic Characteristics of TzM015120 Series MZO.....	2
1.3 The Optical Specifications of TzM015120.....	2
1.4 The Dimension of TzM015120 Series MZO.....	4
2 The Connection of TzM015120 Series MZO and Camera.....	5
3 Pictures Taken with TzM015120 Series MZO.....	5
4 TzM015120 Series MZO Packing List.....	6
5 Order List of TzM015120 Series MZO.....	6
6 Service.....	7

1 The Basic Characteristic of TZM015120 Series MZO

1.1 Introduction of TZM015120 Series MZO

TZM015120 series MZO (Monocular Zoom Objective) is an ideal choice for machine vision, industrial inspection, scientific research and education. The design is based on the bilateral parallel light path principle and the modular design concept, with superior optical performance and strong compatibility.



Figure 1 TZM015120 with different module

1.2 The Basic Characteristics of TZM015120 Series MZO

The basic module of TZM015120 series monocular zoom object is TZM015120-W4100-TV4100-A50. Its main features are shown below:

- With 0.15X~1.20X zoom range, 8X zoom ratio
- Larger NA: 0.008-0.046 (When using 1.00x Auxiliary Lens)
- Higher resolution: 33.1um-5.9um (When using 1.00x Auxiliary Lens)
- Larger sensor size: 2/3" (When using 1.00x TV Lens)
- Working distance range: 130mm (When using 1.00x Auxiliary Lens)
- With adjustable BFL, parfocal in zoom range
- With adjustable center, the image center remains unchanged from 1.20x to 0.15x
- Compact size: 164 mm (Length) × 40 mm (Diameter)
- Auxiliary Lens with 1.00x magnification (Customizable)
- TV Lens with 1.00x magnification (Customizable)
- Brightness adjustable LED Direct Ring Light (Optional)
- LED Transmissive Light (Optional)
- 45mm or 50mm Bracket Adapter (Optional)

1.3 The Optical Specifications of TZM015120

The optical specifications of **TZM015120** are shown in Table 1.

Table 1 TZM015120-W4100-TV4100

Model	WD/mm	PMAG	NA	Camera Size	FOV/mm	Resolution/um
TZM015120(D)-W4100-TV4100	130	0.15x-1.20x	0.008-0.046	1/3"	5.0-40.0	33.1-5.9
				1/2"	6.7-53.3	
				2/3"	9.2-73.0	
TZM015120(D)-W4050-TV4100 (TBD)	260	0.075x-0.60x	0.004-0.023	1/3"	10.0-80.0	68.0-11.9
				1/2"	13.4-106.6	
				2/3"	18.4-146.0	
TZM015120(D)-W4075-TV4100 (TBD)	173	0.1125x-0.90x	0.006-0.035	1/3"	6.7-53.3	45.8-7.9
				1/2"	8.9-71.1	
				2/3"	12.3-97.3	
TZM015120(D)-W4150-TV4100 (TBD)	86	0.225x-1.8x	0.012-0.069	1/3"	3.3-26.7	22.9-4.0
				1/2"	4.5-35.5	
				2/3"	6.1-48.7	
TZM015120(D)-W4200-TV4100 (TBD)	65	0.3x-2.4x	0.016-0.092	1/3"	2.5-20.0	17.2-3.0
				1/2"	3.4-26.7	
				2/3"	4.6-36.5	

WD: Working Distance; **PMAG**: Primary Magnification; **FOV**: Field of View in the object side; **NA**: Numerical Aperture; **D**: represents Detent

1.4 Auxiliary Lens Module

The replaceable **Auxiliary Lens** (code **W4bbb**), which can be threaded to the bottom of the **Middle Zoom Module**, here **4** is the series number, **bbb** represents the magnification of **Auxiliary Lens**. Different magnification of **Auxiliary Lens** defines the entire magnification of **TZM015120** series MZO, resulting different working distance as well. For example, **W4100 Auxiliary Lens** with 1.00x magnification reaches 130mm working distance, while **W4050 Auxiliary Lens** will have a reduced magnification to half and the working distance will be extended to about 260mm. **Auxiliary Lens** and its corresponding optical parameters for **TZM015120** are shown in Table 2.

Table 2 The order number and optical parameters of Auxiliary Lens

Order number	Magnification	Working distance (mmm)
W4050(TBD)	0.50X	260
W4075(TBD)	0.75X	173
W4100	1.00X	130
W4150(TBD)	1.50X	86
W4200(TBD)	2.00X	65

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.

1.5 TV Lens

The **TV Lens** (code **TV4ccc**), which can be threaded to the top of the **Middle Zoom Module**, here **4** is the series number, **ccc** is the magnification of the **TV Lens**. **TV Lens** with different

magnification is used to adapt to sensors with different size . For example, the same field of view could be obtained when TV4100 is used with a 2/3” size sensor and TV3050 is used with a 1/3” size sensor. [TV Lens](#) and its corresponding optical parameters are shown in Table 3.

Table 3 The order number and optical parameters of TV Lens

Order number	Magnification	The maximum compatible sensor size
TV4100	1.00X	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.

1.6 Bracket Adapter

[Bracket Adapter](#) (code [Add](#)) used for brackets with different mounting apertures and is sheathed in the middle of [MZO](#). [dd](#) is the diameter of the bracket. Current available [Adds](#) include [A50](#) and [A45](#). The installation method of the [Bracket Adapter](#) and bracket is shown in [Figure 2](#)[Figure 5](#).

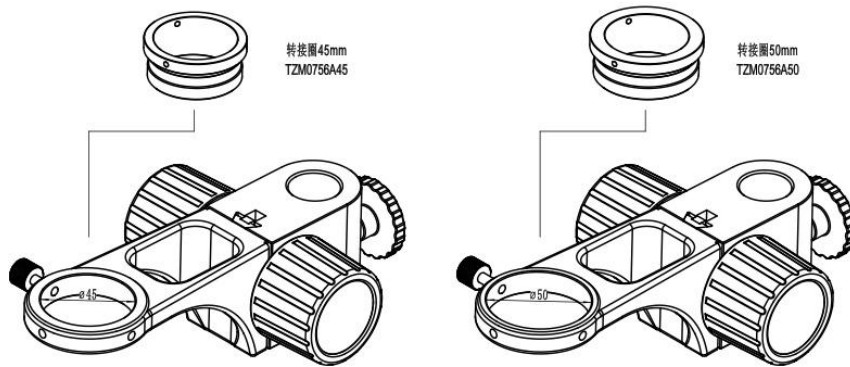


Figure 2 [TZM015120 series MZO bracket adapter](#), [TZM015120 系列 MZO 支架适配器](#)

1.7 The Dimension of TZM015120 Series MZO

The dimension of [TZM015120-W4100-TV4100](#) is shown in [Figure 3](#)[Figure 2](#).

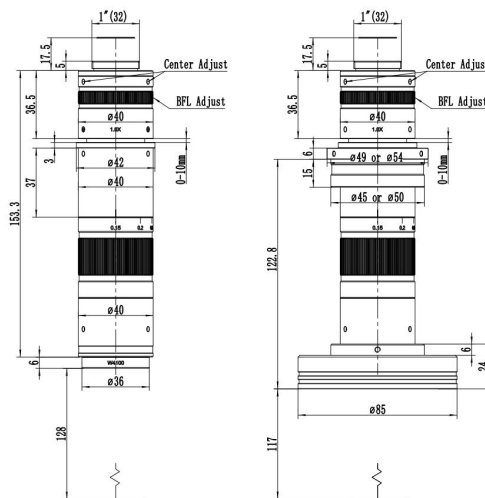


Figure 3 Dimension of TZM015120-W4100-TV4100 (Left)

Dimension of TZM015120-W4100-TV4100-A50+TZM0756DRL-85 light (Right)

2 The Connection of TZM015120 Series MZO and Camera



Figure 4 TZM015120-W4100- TV4100+TZM0756DRL-85+HDMI Camera+TPS-210A+SCRN

3 Pictures Taken with TZM015120 Series MZO

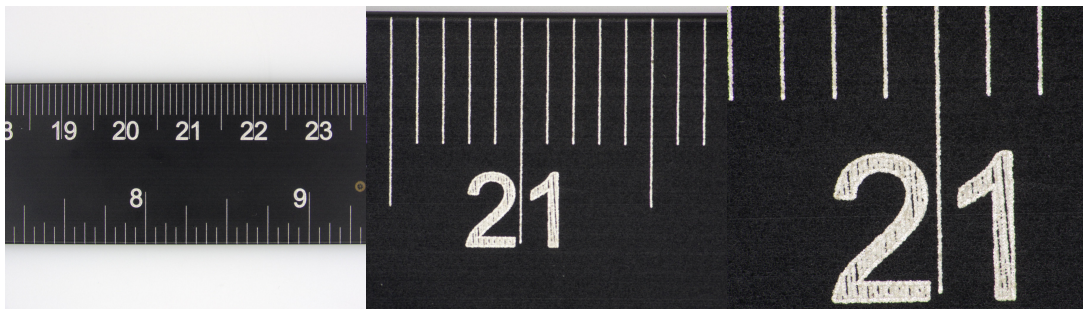


Figure 5 Images of ruler taken with TZM015120-W4100-TV4100 under LED Direct Ring Light illumination
left) 0.15X, middle) 0.6X, right) 1.2X

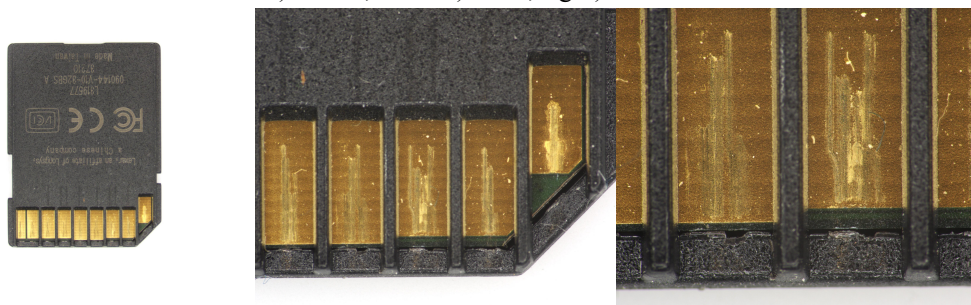


Figure 6 Images of SD Card taken with TZM015120-W4100-TV4100
left) 0.15X, middle) 0.6X, right) 1.2X

4 TZM015120 Series MZO Packing List

The packing information of the [TZM015120](#) series MZO is as follows:



Figure 7 The TZM015120 Main Body, including Auxiliary Lens Module, Middle Zoom Module, TV Lens, Camera Adapter Tube and Bracket Adapter

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



Figure 8 TZM0756DRL-85, including LED Direct Ring Light and Power Adapter

5 Order List of TZM015120 Series MZO

Table 4 TZM015120 Function Module Optional Order List

Module	Order number	Quantity	Remarks	Description
Middle Zoom Module	TZM015120			Ordinary Middle Zoom Module
	TZM015120D			Middle Zoom Module with detent
Auxiliary Lens Module	W4100			1.0X Object Lens
	W4050(TBD)			0.5X Object Lens
	W4075(TBD)			0.75X Object Lens
	W4150(TBD)			1.5X Object Lens
	W4200(TBD)			2.0X Object Lens
TV Lens	TV4100			For 2/3" Sensor
Bracket Adapter	A45			45mm Bracket Adapter

	A50			50mm Bracket Adapter
LED Direct Ring Light Module	TZM0756DRL-85			LED Direct Ring Light (85mm outer diameter)
Transmissive Light Module	TZM0756TL			LED Transmissive Light
Power of Light Source	40600014			POWER-U-12V1A(American Standard)
	40600015			POWER-E-12V1A(European standard)

6 Service

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

For technical support, please contact e-mail address: tphz@toupstek.com.