



PROMINAR 500mm F5.6 FL / TX10



PROMINAR 500mm F5.6 FL  
FC XD DF

# Telephoto Lens/Scope

**PROMINAR super-telephoto lenses incorporate fluorite crystal lenses to realize a high resolution**

In order to limit chromatic aberration (color blur) to the utmost, which tends to easily occur in lenses with long focal lengths, one fluorite crystal lens and two XD (eXtra low Dispersion) lenses having particularly low dispersion capabilities are utilized. By bringing together advanced optical technology fostered through the development of spotting scopes, and incorporating fluorite crystal lenses with outstanding optical characteristics, high contrast and extremely sharp images can also be realized as a camera lens. Further, due to the high-level aberration correction and the utilization of a rounded diaphragm, an attractive effect can be obtained in out-of-focus areas as the pinnacle of imaging expression for a camera lens.

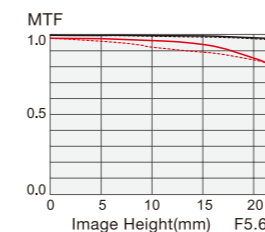
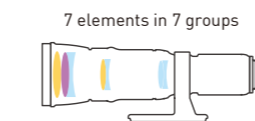
**Dual-focus system that realizes ease of use in manual focusing**

To enable the focus to be precisely adjusted by manual focusing, Kowa spotting scopes also utilize a highly reputed dual-focus system. In addition to using a high-contrast optical system that enables the focusing peak to be easily determined, a dual-focus system consisting of a quick focus that swiftly matches the focus and a fine focus for delicate focus adjustment is used. This enables precise adjustment to be carried out, even under the severe conditions encountered in super-telephotography.

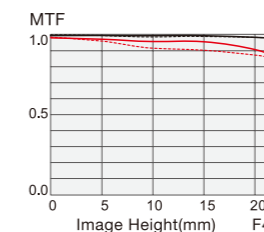
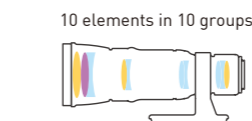


## 350mm, 500mm, and 850mm Three Focal Lengths in One Lens

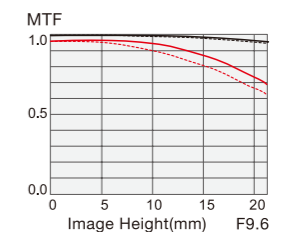
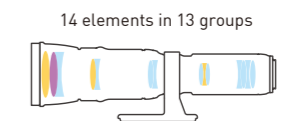
500mm F5.6(Using the TX10)



350mm F4 Using the TX07



850mm F9.6 Using the TX17



- Fluorite Crystal Lens
- XD Lens
- S — 10 LP/mm
- M --- 10 LP/mm
- S — 30 LP/mm
- M --- 30 LP/mm

# Telephoto Lens

Three types of focal lengths, 350mm, 500mm, and 850mm, can be used as required in the one unit

From the standard specification of 500mm F5.6, it is possible to change the focal length of the master lens to a brighter 350mm F4 super-telephoto lens using the TX07 optional mount adapter, or to a lens with an even higher super-telephoto effect of 850mm F9.6 using the optional mount adapter TX17. The 350mm and 850mm mount adapters have been designed specifically for use in combination with the master lens, and the incorporation of XD lenses also inside each of the mount adapters realizes an outstanding optical performance comparable to that of previous dedicated lenses. (All lenses support 35mm full size format.)

Mount interchanging system that allows effective use of cameras made by several manufacturers

Anticipating the use of digital cameras made by several different manufacturers, a bayonet mount system is utilized that allows easy mounting and release. This makes it possible not only to exchange cameras, but also to exchange each of the mount adapters in an instant. Since the prism unit also employs an exchanging system that utilizes bayonet mounting, the switching between photographing and viewing can also be easily carried out.



Supported mounts: Nikon mount, Canon mount, Pentax mount, Micro Four Thirds mount, Sony "A" mount\*

# Scope

Kowa's standard eyepiece bayonet mount is utilized in these spotting scopes.



By connecting the optional prism unit and eyepiece, the telephoto lens can be used as a spotting scope by effectively making use of the high performance master lens optical system. Due to the utilization of a mounting and release system that uses a bayonet mount, the single telephoto lens can be easily used both for "photographing" and "viewing". Clear images can be enjoyed with a feeling of transparency since there is no focusing screen.

Digiscoping opens up a world of even higher super-telephotography between 1000mm and 3000mm\*



By connecting an optional digital camera adapter to the lens in the spotting scope condition, it will be possible to carry out digiscoping using a compact digital camera. Using digiscoping, it will be possible to carry out even higher super-telephotography between approximately 1000mm and 3000mm\*, allowing wild birds and other subjects to be photographed at long ranges that would not be possible using digital SLR cameras. (Eyepieces that support digiscoping: TE-11WZ, TE-17W, TE-10Z, and TE-20H) \* 35mm full size format equivalent effective focal length

# Features

Lightweight and compact design that realizes outstanding portability.

The 500mm super-telephoto lens only weighs around 1.9kg. The portability is extremely good, and the lightweight design also allows hand-held shooting. Further, when the mount adapter is removed, the compact design with a total length of only approximately 250mm allows it to be carried in a small rucksack.



Tripod mounting foot that allows mounting on video heads without modification

The tripod mounting foot has a format that allows mounting on some types of Manfrotto and Gitzo video heads without requiring a quick shoe. Simple mounting and release is possible on the video heads mentioned above, so that the lens can be used without worrying about the tripod screw coming loose. Mounting can also be carried out on other manufacturers' tripod heads. (1/4 inch mount screws are supported.)



Lens hood with attached sighting device allows objects to be captured quickly

A lightweight lens hood is provided as a standard accessory. In order to increase the speed for introducing the subject into the field of view when carrying out super-telephotography, a sighting function is incorporated in the hood. The hood mounting screw has a special shape that assists with the swift sighting of objects when used in combination with the included sighting devices.



Dustproof and Weatherproof Structure

The objective lens and focusing units utilize rubber O-rings to seal the housing of the lens for enhanced dust and weatherproofing.



# Options

500mm Mount Adapter [TX10]



Supported Mounts  
Nikon F  
Canon  
Pentax K  
Micro Four Thirds  
Sony "A"  
Mount adapter for 500mm focal length

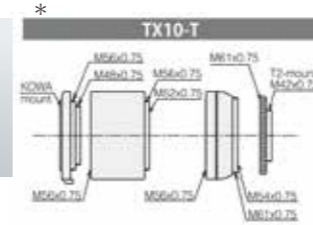
350mm Mount Adapter [TX07]



Supported Mounts  
Nikon F  
Canon  
Pentax K  
Micro Four Thirds  
Sony "A"  
Mount adapter for 350mm focal length

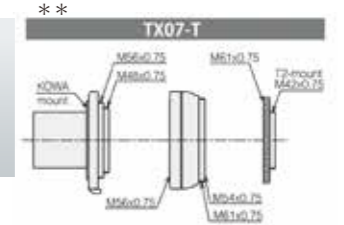
500mm Mount Adapter [TX10-T]

Mount adapter for 500mm focal length with T-Ring(TSN-CM2) and M56/M48/M61x0.75.\*



350mm Mount Adapter [TX07-T]

Mount adapter for 350mm focal length with T-Ring(TSN-CM2) and M56/M48/M61x0.75.\*\*



850mm Mount Adapter [TX17]



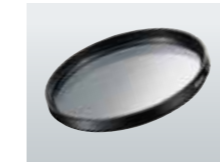
Supported mounts  
Nikon F  
Canon  
Pentax K  
Micro Four Thirds  
Sony "A"  
Mount adapter for 850mm focal length

Prism Unit [TP-88EC1]



By using the lens in combination with the eyepieces for the TSN-880/770 Series, the lens can be used as a spotting scope.  
\* By using together with the TSN-EC3, the eyepieces for the TSN-660M/600 Series can also be used.

Protection Filter [TP-95FT] 880 556



Filter Thread: 95mm  
Thread pitch: 1.0mm  
Protective filter that has had water repellent and oil repellent processing applied.  
Even if fingerprints or water droplets become attached to the filter, they can be easily wiped off.

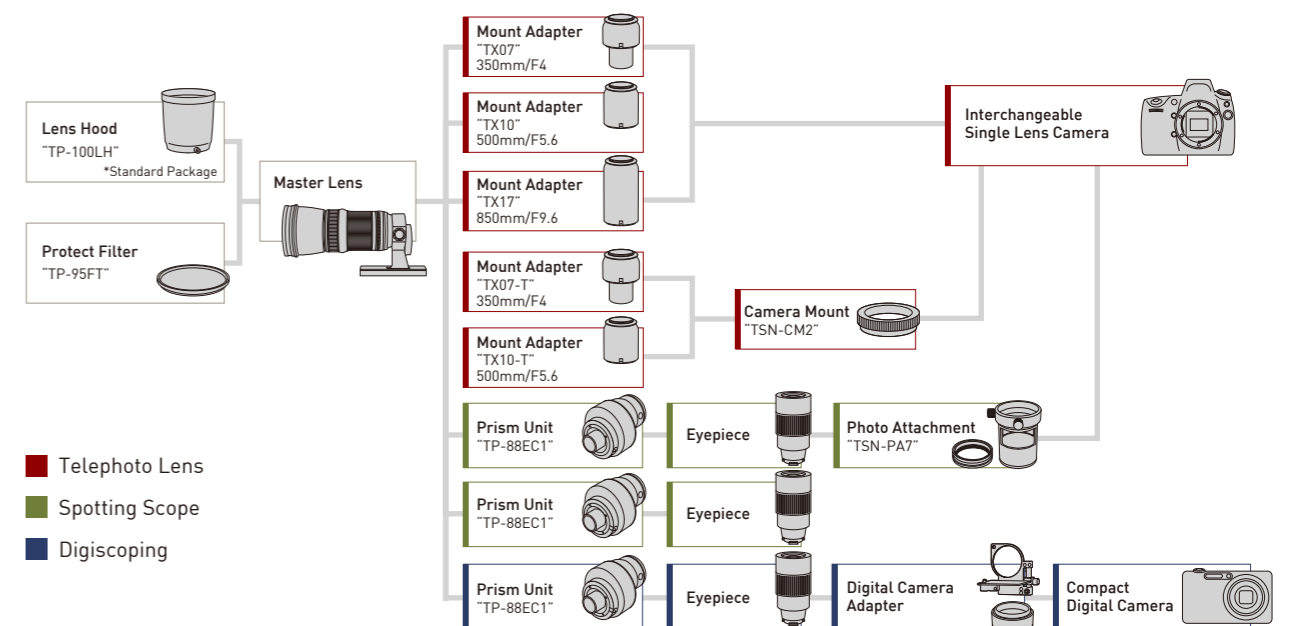
Lens Hood [TP-100LH]



A lightweight long hood provided as a standard accessory.

\* Refer to page 8 for details of the various types of eyepieces.

# System Configuration







# Smart phone Photo System

## TSN-IP5

iPhone 5/5s/SE digiscoping holder

## TSN-IP6

iPhone 6/6s digiscoping holder

## TSN-IP7

iPhone 7 digiscoping holder

## TSN-GA4S

Samsung Galaxy S4 digiscoping holder

## TSN-GA5S

Samsung Galaxy S5 digiscoping holder



The iPhone 5/5s/SE/6/6s/7 or Samsung Galaxy S4/S5 sits firmly in the TSN-IP5/IP6/IP7/GA4S/GA5S digiscoping holder and simply pushes over your eyepiece.

Transform your iPhone 5/5s/SE, 6/6s, 7 or Samsung Galaxy S4/S5 into a super telephoto lens.

Now you can combine the high quality camera and HD video functions of these smartphones with the power and legendary quality of a Kowa spotting scope or binocular to create an ultra compact, high quality super telephoto lens.

It couldn't be easier to start taking highly magnified images or HD video with your iPhone/Galaxy and Kowa optic via the Kowa TSN-IP5, TSN-IP6, TSN-IP7, TSN-GA4S or TSN-GA5S digiscoping holder.

KOWA SPOTTING SCOPE SERIES	EYEPIECE	ADAPTER RING
TSN-880 TSN-770	TE-11WZ(25-60x widezoom)	Included
	TE-10Z(20-60x zoom)	Included
	TE-17W(30x wide)	Included
TSN-660M TSN-600 TSN-B2SV	TE-20H(25x LER)	TSN-AR30 TSN-SS1 TSN-DA10
	TE-9Z(20-60x zoom)	TSN-AR66Z
	TE-9WD(45x wide)	TSN-AR66Z
	TE-14WD(30x wide)	TSN-AR66HL
TSN-550	TE-21WD(20x wide)	TSN-AR66HL
	-	TSN-AR66Z
TSN-500	-	TSN-AR500

Opening up the world of super-telephotography with digiscoping

# What's "Digiscoping" system?



## What is "Digiscoping" ?

Digiscoping is a method of taking photographs through the combination of a spotting scope and a digital camera. By using the spotting scope as a telephoto lens, it is easy to enjoy digital photography at effective focal lengths of over 1,000mm\*.

### [Method of calculating the effective focal length]

Focal length of digital camera\* x Magnification of spotting scope (eyepiece) = Effective focal length\*

Ex.: Using a digital camera with focal length of 114mm and an eyepiece magnification of 30x:

$$114 \text{ (mm)} \times 30 \text{ (magnification)} = 3,420 \text{ (mm)}$$

\* Converted to 35mm full size format.

## Super-Telephotography Over 1,000mm

Connecting a digital camera to a spotting scope produces super-telephoto images. Inaccessible wildlife and scenery can be photographed with amazing detail.



## Lightweight and Compact

There can be a lot of walking when digiscoping and it is important for the equipment to be as light as possible. A typical digiscoping system is 6 to 11 pounds, including the weight of the tripod. You can enjoy super-telephotography with a system that is lighter and more compact than one telephoto SLR lens. This is a very attractive feature for long trips or traveling.

## Photography at 1,000mm/F2.8

The use of a compact digital camera in a digiscoping system permits super-telephotography with a very small F-number. (The F-number changes according to the objective lens diameter if the spotting scope.)

## Wide Focal Range with One Camera

The focal length of a digiscoping system can be changed by simply increasing or decreasing the magnification of the eyepiece. Digiscoping can be done at a wide range of focal lengths without changing the digital camera or spotting scope.

## Quickly Change from Viewing to Photographing

The Kowa digital camera adapter is secured in place with a single screw, allowing for quick and easy switching between viewing and photographing.

## What is vignetting?

The darkening phenomenon that appears around an image is called vignetting. When digiscoping, it is important to choose the appropriate adapter and eyepiece to reduce vignetting as much as possible.



## Why does vignetting occur? How can it be reduced?

Vignetting occurs when the angle of view of the camera is larger than the apparent field of view of the eyepiece.

A wide angle eyepiece is effective in reducing vignetting.



Vignetting occurs when the eye relief of an eyepiece is not sufficient for the camera to capture the full image.

A long eye relief eyepiece is effective in reducing vignetting.



## Digiscoping Advice

### Prevent Shaking and Image Blur

- Even slight shaking and vibration can affect super-telephoto images. Use a sturdy tripod with an easy to operate head to prevent shaking and image blur.
- Due to the extremely large focal length, the use of a cable shutter release, remote control or timer, is recommended to eliminate shaking and image blur.

### Digiscoping Tips

- The liquid crystal display of the camera can be difficult to see when outdoors. The use of a hood will increase visibility and make it easier to confirm the shot.
- The balance of the entire digiscoping system is very important for easy operation. The use of a balance plate or Kowa's "Universal Mount System" is recommended to properly adjust the balance of the system.
- Use the sight on the spotting scope or attach an optical sight to quickly bring an object into view.



## Environmental Friendly Photo Session

### Behavior during photographing

Be aware of your surroundings when out in the field. Do not trespass on private property or enter sensitive wildlife areas. Enjoy your viewing and photographing while behaving in an environmentally considerate manner.

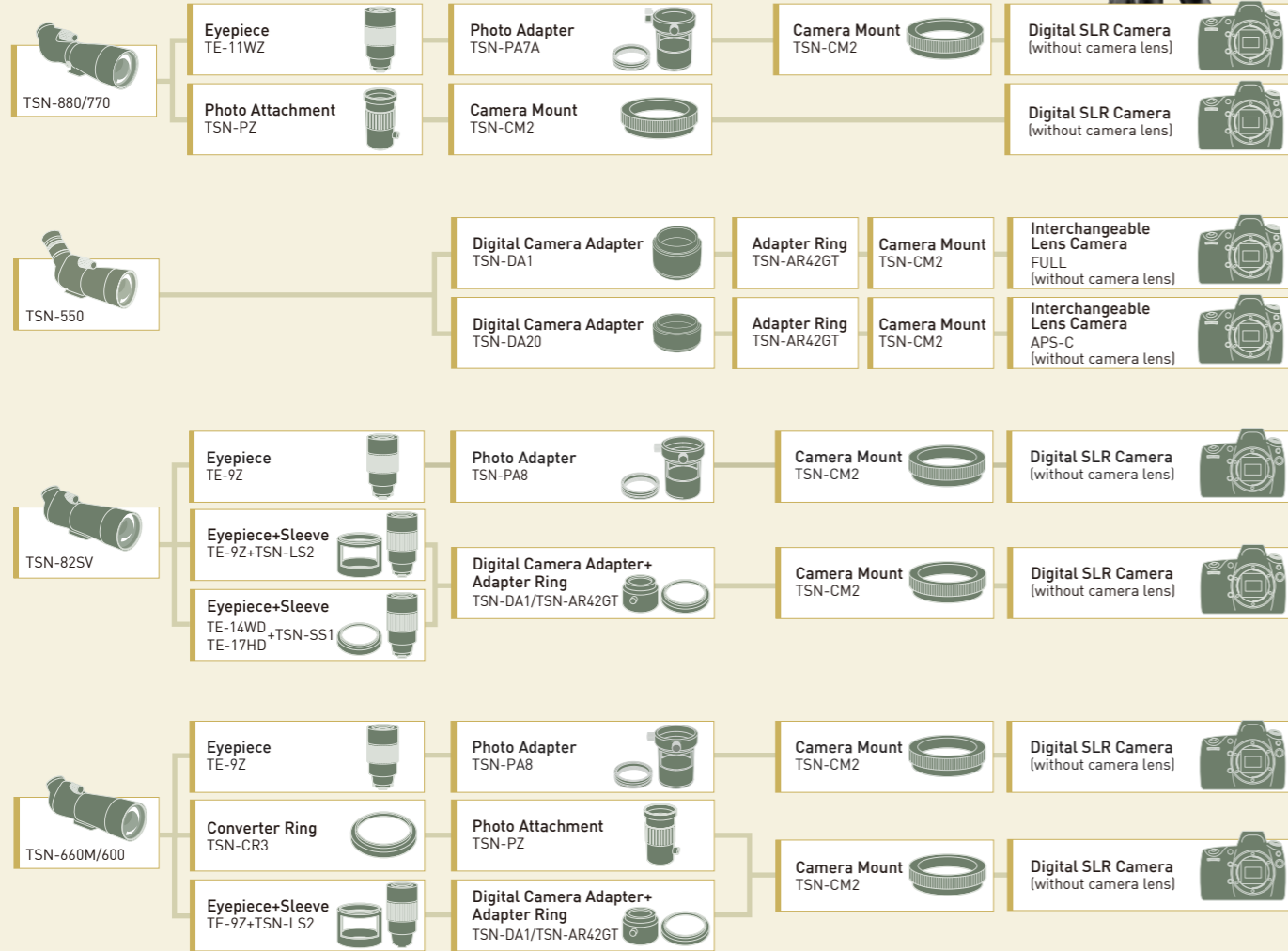


# Digiscoping/Videoscoping System Chart



## Super-Telephotography with a Single Lens Reflex Camera

Attach a 35mm film single lens reflex camera or digital single lens reflex camera to a Kowa spotting scope for super-telephotography.

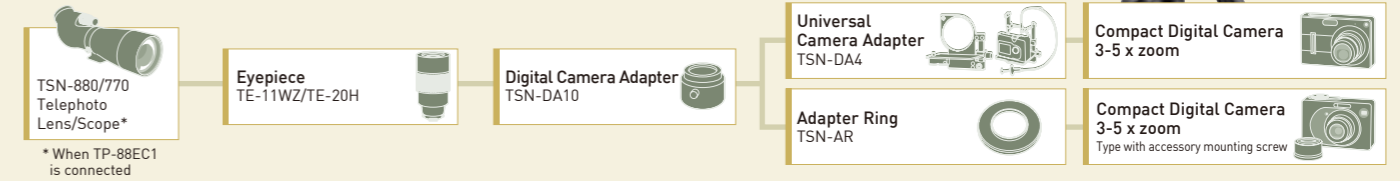


## Compact Digital Camera Digiscoping System Diagram

Attach a compact digital camera to a Kowa spotting scope for Super-telephotography.



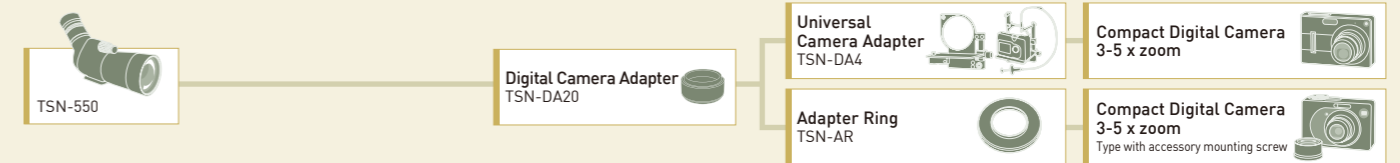
[TSN-880 Series, Telephoto Lens/Scope Digiscoping System Diagram]



[TSN-82SV]



[TSN-550 Series]

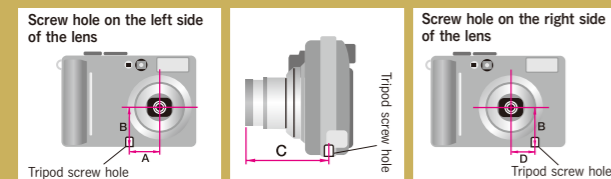


[TSN-660M/600 Series Digiscoping System Diagram]



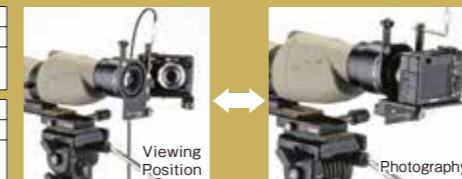
### TSN-DA4 Compatibility

The TSN-DA4 universal camera adapter can be used with cameras that meet the following criteria.



- The TSN-DA4 allows a compact digital camera without filter threads to be used for digiscoping.
- Quickly change between photographing and viewing through the scope.
- The camera is attached to the adapter with the camera's tripod mount. Locking mechanisms ensure safe operation.

A	0~44mm
B	21~40mm
C	~56mm (When the power is switched on and the lens is fully extended)
D	0~28mm
B	21~40mm
C	~56mm (When the power is switched on and the lens is fully extended)



For cameras with the tripod mount to the left of the lens (facing the lens).  
 A. The distance between the center of the tripod mount and the center of the lens.  
 B. The distance between the center of the lens and the base of the camera.  
 C. The distance between the center of the tripod mount and the front of the lens.

For cameras with the tripod mount to the right of the lens (facing the lens).  
 D. The distance between the center of the tripod mount and the center of the lens.  
 B and C are the same as above.

# Specifications

## Spotting Scope

Model	TSN-880 Series		TSN-550 Series		TSN-770 Series		TSN-660M Series	
	TSN-883	TSN-884	TSN-553	TSN-554	TSN-773	TSN-774	TSN-663M	TSN-664M
Objective Lens Effective Diameter	88mm	88mm	55mm	55mm	77mm	77mm	66mm	66mm
Objective Lens	Fluorite Crystal Lens		Fluorite Crystal Lens		XD Lens		XD Lens	
Minimum Focusing Distance	5 m	5 m	3 m	3 m	5 m	5 m	6 m	6 m
Length	343mm	329mm	271mm	288mm	318mm	304mm	311mm	311mm
Weight	1520g	1520g	810g	800g	1330g	1330g	1040g	1020g
Filter Thread	95mm	95mm	58mm	58mm	82mm	82mm	72mm	72mm

Model	TSN-600 Series		TSN-500 Series		TSN-82SV
	TSN-601	TSN-602	TSN-501	TSN-502	
Objective Lens Effective Diameter	60mm	60mm	50mm	50mm	82mm
Objective Lens	Normal Lens		Normal Lens		Normal Lens
Minimum Focusing Distance	6 m	6 m	2.5 m	2.5 m	6 m
Length	299mm	298mm	241mm	259mm	383mm
Weight	735g	720g	400g	400g	1490g
Filter Thread	67mm	67mm	55mm	55mm	86mm

\* Mounting of commercially available filters is possible.

## Telephoto Lens/Scope

Model	500mm F5.6 (with TX10)	350mm F4 (with TX07)	850mm F9.6 (with TX17)
Focal Length	500mm	350mm	850mm
Maximum Aperture	F5.6	F4	F9.6
Lens Construction	7 Elements in 7 Groups	10 Elements in 10 Groups	14 Elements in 13 Groups
Fluorite Crystal Lens	1	1	1
XD Lens	2	3	3
Field of View (Full Size)	4.9°	7.0°	2.9°
F-Number	F5.6~11	F4~8	F9.6~19
Iris Blades	9	9	9
Minimum Focusing Distance	3m	3m	3m
Maximum Reprojection Ratio	0.17x	0.12x	0.29x
Filter Thread	95mm	95mm	95mm
Weight*	1970g	2025g	2270g
Maximum Diameter x Length*	φ 104x341mm (φ 4x13.4in)	φ 104x296.5mm (φ 4x11.7in)	φ 104x396mm (φ 4x15.6in)

\* Using the Nikon mount, excluding the lens hood

## Standard Package

- ① Master Lens
  - ② Mount Adapter "TX10"  
Available Mounts: Nikon, Canon, Pentax, Micro Four-Thirds, SONY "A"
  - ③ Lens Hood "TP-100LH"
  - ④ Objective Cap
  - ⑤ Mount Adapter Cover
  - ⑥ Mount Lens Cover
  - ⑦ Camera Mount Cover
  - ⑧ Sights(S/M/L)
- Manual



## [Eyepiece]

Model	TSN-880/770 Series				TSN-660M/600 Series						TSN-82SV		
	TE-11WZ		TE-20H		TE-9Z		TE-14WD		TE-17HD		TE-9Z	TE-14WD	TE-17HD
TSN-880	TSN-770	TSN-880	TSN-770	TSN-660M	TSN-600	TSN-660M	TSN-600	TSN-660M	TSN-600				
Magnification	25~60x WIDE ZOOM		25xLER		20~60x ZOOM		30xWIDE		25xLER		21~63xZOOM	32xWIDE	27xLER
Field of View	2.4° ~1.32°		2.1°		1.9° ~1.0°		2.4°		2.1°		1.8° ~0.95°	2.2°	2.0°
Exit Pupil	3.5~1.5mm	3.1~1.3mm	3.5mm	3.1mm	3.3~1.1mm	3.0~1.0mm	2.2mm	2.0mm	2.6mm	2.4mm	3.9~1.3mm	2.6mm	3.0mm
Relative Brightness	12.3~2.3	9.6~1.7	12.3	9.6	10.9~1.2	9.0~1.0	4.8	4.0	6.8	5.8	6.8~1.7	6.8	9.0
Twilight Factor	46.9~72.7	43.9~68.0	46.1	43.9	36.3~62.9	34.6~60.0	44.5	42.4	40.6	38.7	41.5~71.9	51.2	47.1
Eye Relief	17mm		32.0mm		16.5~16.0mm		20.0mm		32.0mm		16.5~16mm	20mm	32mm
Field of View at 1000m	42~23m		37m		33~17m		42m		37m		31~17m	38m	35m

## [Eyepiece]

Model	Telephoto Lens/Scope				
	TE-11WZ	TE-20H	TE-9Z*	TE-14WD*	TE-17HD*
Magnification	28~66x WIDE ZOOM	28x LER	26~78x ZOOM	40x WIDE	32x LER
Field of View	2.2° ~1.2°	1.9°	1.45° ~0.75°	1.8°	1.6°
Exit Pupil	3.2~1.3mm	3.2mm	3.4~1.1mm	2.2mm	2.7mm
Relative Brightness	10.2~1.8	10.2	11.3~1.3	4.8	7.4
Twilight Factor	49.2~76.2	49.2	48.0~82.8	59.3	53.4
Eye Relief	17mm	32.0mm	16.5~16.0mm	20.0mm	32.0mm
Field of View at 1000m	38~21m	33m	25~13m	31m	28m

\* Mounting will be possible using the TSN-EC3.

## [Photo Attachment]

Model	TSN-PZ				TSN-PA7A		TSN-PA8		
	TSN-880	TSN-770	TSN-660M	TSN-600	TSN-880/770	Telephoto Lens	TSN82SV	TSN660	TSN600
Supported Scopes	TSN-880	TSN-770	TSN-660M	TSN-600	TSN-880/770	Telephoto Lens	TSN82SV	TSN660	TSN600
Focal Length	680~1000mm	560~840mm	560~840mm	560~840mm	1000~2450mm	1100~2700mm	1150~3300mm	1050~2950mm	1050~2950mm
F Value	7.7~11.4	8.8~13.0	8.5~12.7	9.3~14.0	12.4~27.8 (880) 14.2~31.8 (770)	12.5~30.7	14~40.2	15.9~44.7	17.5~49.2
Minimum Focusing Distance	5m		6m		6m	5m	6m	6m	6m
Total Length	105mm				100mm		95mm		
Weight	350g				210g		200g		

\* In the case of mounting a digital SLR camera, the focal length will change according to the image sensor size.



## Precautions for use

For correct and safe use of this product:

Before using the product, be certain to carefully read the instruction manual. Do not under any circumstances use this product to look at the sun, since this may result in loss of eyesight.

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