



- HOME
- ABOUT US
- PRODUCTS
- BRANDS
- PROMOTIONS
- DOWNLOADS
- CONTACT US

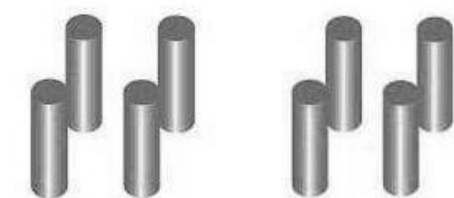
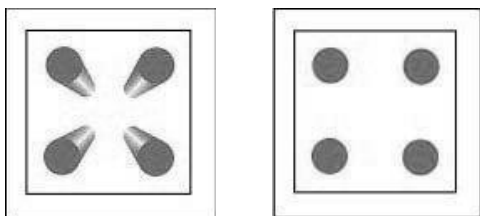
Telecentric

Telecentric Lenses

We offer an extensive range of high quality telecentric lenses that are also cost efficient.

Explanation of Telecentric lenses

Parallax errors are an everyday occurrence. We predict closer objects are bigger than objects far away. This appearance means that the objects magnification changes according to the lens' distance from the image system. Telecentric lenses optically adjusts this appearance, so that the object looks the same regardless of the location.



(a) Using Standard Lenses (b) Using Telecentric Lenses

Excellent for measurement, telecentric lenses delivers precision measurement images. Because it has no magnification changes, it is useful in applications measuring depth of field. Common applications includes wafer pattern, LCD marked alignment measurement, BGA ball inspection, PDP align, TFT LCD Mark alignment, Wire bonding alignment. We pride ourselves for carrying a wide range of high quality, cost efficient telecentric lenses.

Standard Telecentric Lens

Mainly used in machine vision positioning, the biggest feature of it are high telecentricity and low distortion, in the application of machine vision the precision of it can be increased by 50% or more compared with non-telecentric lens, it has been acquired widely approvals and applications.

All with object-side telecentric design

- Support 1/2 inch CCD, part of the lenses support up to 2/3 inch
- Support 800,000 pixels or more CCD
- High depth of field design, 30%-50% higher than the same level foreign telecentric lens
- Compact design
- C-mount



WD65MM

Type	Coaxial	TL-T08X65D	TL-T1X65D	TL-T2X65D	TL-T3X65D	TL-T4X65D	TL-T6X65D	TL-T8X65D
Non-Coaxial		TL-T08X65	TL-T1X65	TL-T2X65	TL-T3X65	TL-T4X65	TL-T6X65	TL-T8X65
Magnification		0.8X	1X	2X	3X	4X	6X	8X
Working Distance		65mm	65mm	65mm	65mm	65mm	65mm	65mm
Depth of field		2mm	1.8mm	0.58mm	0.3mm	0.2mm	0.12mm	0.09mm
Telecentricity		0.02	0.025	0.02	0.02	0.02	0.02	0.02
Resolution		11um	10um	5.5um	5.2um	4.2um	4um	4.2um
TV distortion		0.005%	0.006%	0.02%	0.006%	0.015%	0.013%	0.015%
CCD Format		2/3"	2/3"	1/2"	1/2"	2/3"	2/3"	2/3"
Mount		C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount

WD110MM

Coaxial Illumination



Type Coaxial	TL-T03X110D	TL-T05X110D	TL-T08X110D	TL-T1X110D	TL-T2X110D	TL-T3X110D	TL-T4X110D	TL-T6X110D
Non-Coaxial	TL-T03X110	TL-T05X110	TL-T08X110	TL-T1X110	TL-T2X110	TL-T3X110	TL-T4X110	TL-T6X110
Magnification	0.3X	0.5X	0.8X	1X	2X	3X	4X	6X
Working Distance	110mm	110mm	110mm	110mm	110mm	110mm	110mm	110mm
Depth of field	17mm	7mm	2.7mm	2.2mm	0.5mm	0.37mm	0.26mm	0.18mm
Telecentricity	0.02	0.16	0.02	0.02	0.01	0.01	0.02	0.02
Resolution	33um	22um	13.75um	13.75um	8um	6.8um	6.5um	6.5um
TV distortion	0.03%	0.03%	0.01%	0.03%	0.02%	0.02%	0.01%	0.01%
CCD Format	1/2"	1/2"	2/3"	2/3"	1/2"	1/2"	2/3"	2/3"
Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount

Long Working distance Telecentric Lens

In applications where there are mechanical moving parts under the lens, or where arduous working conditions such as high temperatures, humid environment etc exist, long working distance telecentric lens are recommended to protect the imaging device.

- Working distance more than 150mm, up to 420mm
- Maximum support to 1/2
- Support 800,000 pixels or below CCD
- High depth of field
- Telecentric optical design
- C-Mount



Type Coaxial	TL-T1X150D	TL-T2X150D	TL-T2X200D	TL-T1X250D	TL-T1X300D	TL-T2X300D	TL-T1X400D
Non-Coaxial	TL-T1X150	TL-T2X150	TL-T2X200	TL-T1X250	TL-T1X300	TL-T2X300	TL-T1X400
Magnification	1X	2X	2X	1X	1X	2X	1X
Working Distance	150mm	150mm	200mm	250mm	300mm	300mm	400mm
Depth of field	2.2mm	0.75mm	1mm	2.1mm	3.7mm	0.8mm	2.6mm
Telecentricity	0.1	0.5	0.4	<0.1	0.1	0.1	0.1
Resolution	13.75um	10.31um	13.75um	14.3um	22um	11um	18.3um
TV distortion	<0.05%	<0.1%	<0.1%	<0.04%	<0.04%	<0.06%	<0.1%
CCD Format	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount

Megapixel Telecentric Lens

With the universal and rapid development of digital camera, especially where high-pixel digital cameras are widely used, more suitable high resolution telecentric lenses are imperative. They are characterized by high resolution, able to support a large sensitive surface sensor, with ultra-high telecentricity and ultra-low distortion. Lower optical magnification available. Currently our Megapixel Telecentric lens can support up to 5.0 megapixel industrial camera, all of them can support 2/3" format, the telecentricity and distortion of it is 30% better than the same levels products, so as to ensure the measurement precision and high consistency. High-resolution, maximum support 5.0 megapixel CCD (using 2/3) Telecentric design, ultra-low distortion, meeting the needs of high-precision testing

- Maximum compatible CCD size: 2/3 inch
- High-contrast, uniform illumination throughout the field
- Standard C-MOUNT



Type Coaxial	TL-M0.45X85	TL-M0.8X65D	TL-M1X65D	TL-M0.8X110D	TL-M1X110D	TL-M1.5X110D	TL-M2X110D
Non-Coaxial	only	TL-M0.8X65	TL-M1X65	TL-M0.8X110	TL-M1X110	TL-M1.5X110	TL-M2X110
Magnification	0.4X	0.8X	1X	0.8X	1X	1.5X	2X
Working Distance	85mm	65mm	65mm	110mm	110mm	110mm	110mm
Depth of field	4.4mm	1.66mm	1.15mm	1.7mm	1.2mm	0.55mm	0.36mm
Telecentricity	0.05	0.06	0.06	0.02	0.02	0.1	0.08
Resolution	18.3um	8.25um	7.3um	8.25um	7.3um	5.24um	4.46um
TV distortion	<0.08%	<0.09%	<0.002%	<0.01%	<0.03%	<0.07%	<0.1%
CCD Format	1/2"	2/3"	2/3"	2/3"	2/3"	2/3"	2/3"
Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount

Extended Range

Bi Telecentric Lens

- No perspective error over the entire FOV
- High depth of field design

- Manual iris



Type	TLV-B0.166X166-12M	TLV-B0.3X110-8M	TLV-B0.5X65-5M
Magnification	0.166X	0.3X	0.5X
Working Distance	166mm	110mm	65mm
Depth of field	26.0mm	11.2mm	1.6mm
Telecentricity	<0.2°	<0.1°	<0.2°
Resolution	9.7um	7.0um	5.5um
Optical distortion	<0.1%	<0.1%	<0.1%
Effective F No	F3 – Close	F3.75 – Close	F5.0
CCD Format	2/3"	2/3"	2/3"
Mount	C-Mount	C-Mount	C-Mount

Megapixel Lens

- Compact design Megapixel Object side Telecentric Lens
- Exerts true power in highly detailed alignments
- Equipped with Manual Iris adapted for adjusting D.O.F.(option)
- Coaxial Option available



Type Coaxial	TLV-M0.45X85	TLV-M0.8X65D	TLV-M1X65D	TLV-M0.8X110D	TLV-M1X110D	TLV-M1.5X110D	TLV-M2X110D
Non-Coaxial	only	TLV-M0.8X65	TLV-M1X65	TLV-M0.8X110	TLV-M1X110	TLV-M1.5X110	TLV-M2X110
Magnification	0.4X	0.8X	1X	0.8X	1X	1.5X	2X
Working Distance	85mm	65mm	65mm	110mm	110mm	110mm	110mm
Depth of field	4.4mm	1.66mm	1.15mm	1.7mm	1.2mm	0.55mm	0.36mm
Telecentricity	0.05	0.06	0.06	0.02	0.02	0.1	0.08
Resolution	18.3um	8.25um	7.3um	8.25um	7.3um	5.24um	4.46um
TV distortion	<0.08%	<0.09%	<0.002%	<0.01%	<0.03%	<0.07%	<0.1%
CCD Format	1/2"	2/3"	2/3"	2/3"	2/3"	2/3"	2/3"
Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount

Fixed Magnification Lenses

Fixed-magnification Lenses are developed to be compact, outstanding cost-performance ratio models with lens design of non-telecentric optical system. We have succeeded in achieving high performance at reasonable prices.

Magnification and WD could be accommodated to your individual needs by using an optional closed-up ring adapter.

Ideal for installation in manufacturing equipment with space restrictions requesting compact lenses



WD 65mm

Type Coaxial	FMV-0.8X65D	FMV-1X65D	FMV-1.5X65D	FMV-2X65D	FMV-3X65D	FMV-4X65 only
Non-Coaxial	FMV-0.8X65	FMV-1X65	FMV-1.5X65	FMV-2X65	FMV-3X65	
Magnification	0.8X	1X	1.5X	2X	3X	4X
Working Distance	65mm	65mm	65mm	65mm	65mm	65mm
Depth of field	0.75mm	0.5mm	0.88mm	0.32mm	0.21mm	0.17mm
Resolution	5.0um	4.5um	11.2um	5.6um	6.2um	6.2um
CCD Format	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount

WD 110mm

Type Coaxial	FMV-0.5X110 only	FMV-0.8X110D	FMV-1X110D	FMV-1.5X110D	FMV-2X110D	FMV-3X110D	FMV-4X110 only

Non-Coaxial		FMV-0.8X110	FMV-1X110	FMV-1.5X110	FMV-2X110	FMV-3X110	
Magnification	0.5X	0.8X	1X	1.5X	2X	3X	4X
Working Distance	110mm	110mm	110mm	110mm	110mm	110mm	110mm
Depth of field	2.02mm	1mm	0.89mm	0.53mm	0.36mm	0.23mm	0.17mm
Resolution	8.5um	6.5/6.7um	7.5um	6.7um	6.1um	6.1um	6.1um
CCD Format	1/2"	1/2" ; 1.3"	1/2" ; 1/3"	2/3"	2/3"	1/2"	1/2"
Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount

WD 150mm

Type Coaxial	FMV-0.5X150 only	FMV-0.8X150D	FMV-1X150D	FMV-1.5X150D	FMV-2X150D	FMV-3X150D
Non-Coaxial		FMV-0.8X150	FMV-1X150	FMV-1.5X150	FMV-2X150	FMV-3X150
Magnification	0.5X	0.8X	1X	1.5X	2X	3X
Working Distance	150mm	150mm	150mm	150mm	150mm	150mm
Depth of field	2.0mm	1.3mm	1.1mm	0.65mm	0.50mm	0.35mm
Resolution	2.0um	1.3um	1.1um	0.65um	0.5um	0.3um
CCD Format	1/3"	1/2" ; 1.4"	1/2" ; 1/3"	1/2" ; 1/3"	1/2"	1/2"
Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount

WD 250mm

Type Coaxial	FMV-0.3X250 only	FMV-0.5X250D only	FMV-0.8X250D only	FMV-1X250D only	FMV-1.5X250D	FMV-2X250D
Non-Coaxial					FMV-1.5X250	FMV-2X250
Magnification	0.3X	0.5X	0.8X	1X	1.5X	2X
Working Distance	250mm	250mm	250mm	250mm	250mm	250mm
Depth of field	8.5mm	5.0mm	2.2mm	1.6mm	7mm	0.75/ 0.50mm
Resolution	24.3um	21.2um	15.0um	13.4um	13.4um	13.4 / 9.3um
CCD Format	1/2"	1/2"	1/2"	1/2"	1/2" ; 1/4"	1/2" ; 1/3"
Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount	C-Mount

Long Working Distance Telecentric Lens

- C-Mount
- Up to 510mm WD
- Ideal choice for the application where long WD is required
- Supporting mega pixels CCDs
- Compact design with optional coaxial illumination



Type Coaxial	TLV-T0.5X510D	TLV-T1X330D	TLV-T1X410D	TLV-T1X510D
Non-Coaxial	TLV-T0.5X510	TLV-T1X330	TLV-T1X410	TLV-T1X510
Magnification	0.5X	1X	1X	1X
Working Distance	510mm	330mm	410mm	510mm
Depth of field	8mm	2.4mm	1.5mm	2mm
Telecentricity	-	<0.02	-	-
Resolution	13.8um	16.3um	10.4um	13.8um
TV distortion	<0.3%	<0.4%	<0.35%	<0.2%
CCD Format	1/2"	2/3"	1/2"	1/2"
Mount	C-Mount	C-Mount	C-Mount	C-Mount

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