

# Large Field Bi-Telecentric lens

To meet the different requirements of FOV

Maximally support to 2/3" camera

DOF can be increased by decreasing F#

1. The FOV (field of view) range from 17.5mm (Min) to 150mm (Max), to meet the different demands of FOV
2. Max support to 2/3" camera
3. Bi-Telecentric design, large aperture, high telecentricity, ultra-low optical distortion, superior optical performance.
4. The listed lens aperture data is the designed maximum aperture, it can be narrowed to increase DOF (depth of focus) if customer have special requirements.
5. Depth of focus is calculated by permissive circle radius of confusion <math>\leq 20\mu\text{m}</math> on the image side, we can also provide customer DOF data at specific resolution and contrast requirements.



Model	Coax	Mag	WD (mm)	Telecentricity (degree)	Distortion (%)	DOF (mm)	F#	MTF>0.3 (LP/mm)	Mount (17.526mm)	FOV FOV for different Sensor size (mm x mm)				
										1/3"	1/2"	1/1.8"	2/3"	8.8x6.6
XF-5MDT0.5X65D	Y	0.5X	65	0.07	0.01	2.54	F6	>150	C-Mount	9.6x7.2	12.8x9.6	14.2x10.7	17.6x13.2	
XF-5MDT0.5X65	N	0.5X	65	0.07	0.01	2.54	F6	>150	C-Mount	9.6x7.2	12.8x9.6	14.2x10.7	17.6x13.2	
XF-5MDT0.4X110D	Y	0.4X	110	0.12	0.02	5.3	F8	>130	C-Mount	12x9	16x12	17.8x13.4	22x16.5	
XF-5MDT0.4X110	N	0.4X	110	0.12	0.02	5.3	F8	>130	C-Mount	12x9	16x12	17.8x13.4	22x16.5	
XF-5MDT0.3X110D	Y	0.3X	110	0.2	0.028	8.6	F8	>135	C-Mount	16x12	21.3x16	23.7x17.9	29.3x22	
XF-5MDT0.3X110	N	0.3X	110	0.2	0.028	8.6	F8	>135	C-Mount	16x12	21.3x16	23.7x17.9	29.3x22	
XF-5MDT0.2X178D	Y	0.2X	178	0.15	0.03	9.5	F8	>120	C-Mount	16x12	21.3x16	23.7x17.9	29.3x22	
XF-5MDT0.2X178	N	0.2X	178	0.15	0.03	9.5	F8	>120	C-Mount	16x12	21.3x16	23.7x17.9	29.3x22	
XF-5MDT0.288X178	N	0.288X	178	0.24	0.13	10.5	F8	>120	C-Mount	16.7x12.5	22.3x16.7	24.9x18.7	30.7x23	
XF-5MDT0.24X150	N	0.24X	150	0.03	0.03	14.6	F8	>130	C-Mount	20x15	26.6x20	29.7x22.3	36.6x27.5	
XF-5MDT0.22X200	N	0.22X	200	0.19	0.05	12.4	F6	>150	C-Mount	21.8x16.3	29x21.8	32.4x24.4	40x30	
XF-5MDT0.2X150	N	0.2X	150	0.04	0.03	21	F8	>130	C-Mount	24x18	32x24	35.6x26.8	44x33	
XF-5MDT0.2X150	N	0.22X	150	0.03	0.03	17.4	F8	>130	C-Mount	21.8x16.3	29x21.8	32.4x24.4	40x30	
XF-5MDT0.2X178D	Y	0.2X	178	0.045	0.05	15.5	F6	>130	C-Mount	24 x 18	32 x 24	35.6x26.8	44 x 33	
XF-5MDT0.2X178	N	0.2X	178	0.035	0.05	15.5	F6	>130	C-Mount	24 x 18	32 x 24	35.6x26.8	44 x 33	
XF-5MDT0.18X178	N	0.18X	178	0.03	0.06	26	F8	>125	C-Mount	26.6x20	35.5x26.6	39.6x29.8	48.8x36.6	

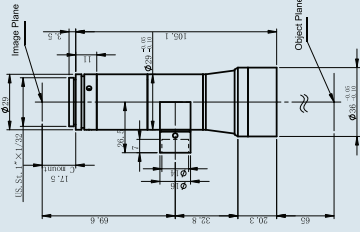
Model	Coax	Mag	WD (mm)	Telecentricity (degree)	Distortion (%)	DOF (mm)	F#	MTF>0.3 (LP/mm)	Mount (17.526mm)	FOV FOV for different Sensor size (mm x mm)				
										1/3"	1/2"	1/1.8"	2/3"	8.8x6.6
XF-5MDT0.18X110D	Y	0.18X	110	0.7	0.04	24	F6	>130	C-Mount	26.6x20	35.5x26.6	39.6x29.8	NA	
XF-5MDT0.18X110	N	0.18X	110	0.7	0.05	24	F6	>130	C-Mount	26.6x20	35.5x26.6	39.6x29.8	48.8x36.6	
XF-5MDT0.16X178	N	0.16X	178	0.04	0.06	33	F8	>125	C-Mount	30x22.5	40x30	44.5x33.5	55x41.2	
XF-5MDT0.16X200	N	0.16X	200	0.4	0.058	22	F8	>180	C-Mount	30x22.5	40x30	NA	NA	
XF-5MDT0.14X178	N	0.14X	178	0.03	0.05	43	F8	>125	C-Mount	34.2x25.7	45.7x34.2	50.9x38.3	62.8x47.1	
XF-5MDT0.145X178	N	0.145	178	0.26	0.06	33.5	F6	>150	C-Mount	44.1x33.1	33.1x24.8	NA	NA	
XF-5MDT0.12X250	N	0.12X	250	0.035	0.04	58	F8	>130	C-Mount	40x30	53.3x40	59.4x44.7	73.3x55	
XF-5MDT0.1X250	N	0.1X	250	0.035	0.05	85	F8	>130	C-Mount	48x36	64x48	71.3x53.7	88x66	
XF-5MDT0.132X110	N	0.132X	110	0.6	0.01	33	F6	>150	C-Mount	36.3x33.1	48.5x36.4	NA	NA	
XF-5MDT0.095X208	N	0.095X	208	0.37	0.06	35	F6	>180	C-Mount	50.5x37.8	67.3x50.5	NA	NA	
XF-5MDT0.068X400	N	0.068X	400	0.21	0.05	120	F6	>150	C-Mount	70.5x52.9	94.1x70.6	104.8x78.9	128.4x87.4	
XF-5MDT0.06X400	N	0.06X	400	0.24	0.04	136	F6	>150	C-Mount	80x60	106.6x80	118.8x69.5	146.6x110	
XF-5MDT0.045X400	Y	0.045X	400	0.21	0.04	240	F6	>150	C-Mount	106.6x80	142.2x106.7	156.4x119.3	191.3x143.5	
XF-5MDT0.045X335	N	0.045X	335	0.26	0.05	230	F6	>150	C-Mount	106.6x80	142.2x106.7	156.4x119.3	191.3x143.5	
XF-5MDT0.05X335	N	0.05X	335	0.21	0.05	210	F6	>150	C-Mount	96x72	128x96	142.6x107.4	176x132	

### XF-5MDT0.5X65D

#### Specifications

Optical structure	Object Telecentric
Magnification	0.5
Object FOV	φ22mm
Image FOV	φ11mm
W.D.	65mm±3%
Telescency	<-0.07°
DOF	2.54mm
F#	8mm
Resolution	8μm
Image side MTF	>0.3@170lp/mm
Optical Distortion	<-0.01%

Measurement size:	2/3 8.8×6.6
	1/2 6.4×4.8
	1/3 4.8×3.6

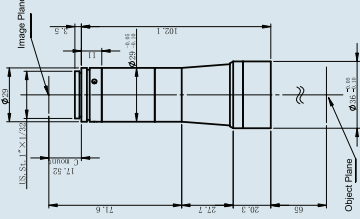


### XF-5MDT0.5X65

#### Specifications

Optical structure	Object Telecentric
Magnification	0.5
Object FOV	φ22mm
Image FOV	φ11mm
W.D.	65mm±3%
Telescency	<-0.07°
DOF	2.54mm
F#	8mm
Resolution	8μm
Image side MTF	>0.3@170lp/mm
Optical Distortion	<-0.01%

Measurement size:	2/3 8.8×6.6
	1/2 6.4×4.8
	1/3 4.8×3.6

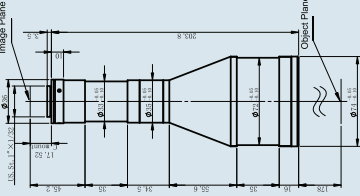


### XF-5MDT0.3X178

#### Specifications

Optical structure	Bi-telecentric
Magnification	0.3
Object FOV	φ38.7mm
Image FOV	φ11mm
W.D.	178mm±3%
Telescency	<-0.15°
DOF	9.5mm
F#	17.4μm
Resolution	17.4μm
Image side MTF	>0.3@120lp/mm
Optical Distortion	<-0.03%

Measurement size:	2/3 8.8×6.6
	1/2 6.4×4.8
	1/3 4.8×3.6

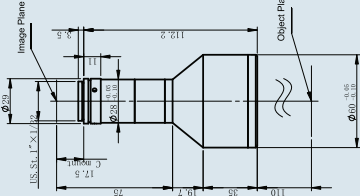


### XF-5MDT0.286X110

#### Specifications

Optical structure	Object Telecentric
Magnification	0.286
Object FOV	φ38.5mm
Image FOV	φ11mm
W.D.	110mm±3%
Telescency	<-0.24°
DOF	10.5mm
F#	F8.4
Resolution	19.4μm
Image side MTF	>0.3@110lp/mm
Optical Distortion	<-0.15%

Measurement size:	2/3 8.8×6.6
	1/2 6.4×4.8
	1/3 4.8×3.6

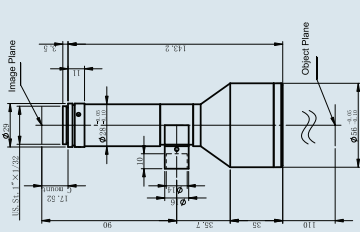


### XF-5MDT0.4X110D

#### Specifications

Optical structure	Object Telecentric
Magnification	0.4
Object FOV	φ27.5mm
Image FOV	φ11mm
W.D.	110mm±3%
Telescency	<-0.21°
DOF	5.3mm
F#	F8
Resolution	13.2μm
Image side MTF	>0.3@125lp/mm
Optical Distortion	<-0.012%

Measurement size:	2/3 8.8×6.6
	1/2 6.4×4.8
	1/3 4.8×3.6

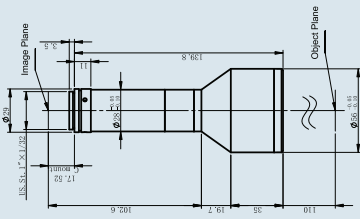


### XF-5MDT0.4X110

#### Specifications

Optical structure	Object Telecentric
Magnification	0.4
Object FOV	φ27.5mm
Image FOV	φ11mm
W.D.	110mm
Telescency	<-0.21°
DOF	5.3mm
F#	F8
Resolution	13.2μm
Image side MTF	>0.3@125lp/mm
Optical Distortion	<-0.017%

Measurement size:	2/3 8.8×6.6
	1/2 6.4×4.8
	1/3 4.8×3.6

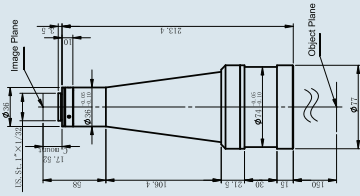


### XF-5MDT0.24X150

#### Specifications

Optical structure	Bi-telecentric
Magnification	0.24
Object FOV	φ45.8mm
Image FOV	φ11mm
W.D.	150mm±3%
Telescency	<-0.031°
DOF	14.6mm
F#	F8
Resolution	22μm
Image side MTF	>0.3@175lp/mm
Optical Distortion	<-0.03%

Measurement size:	3/5 7×27.5mm
	2/5 7×20mm
	20×15mm

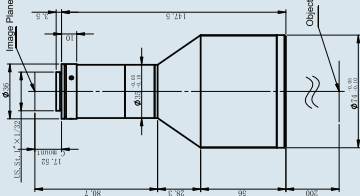


### XF-5MDT0.22X200

#### Specifications

Optical structure	Object Telecentric
Magnification	0.22
Object FOV	φ40mm
Image FOV	φ8.8mm
W.D.	200mm±3%
Telescency	<-0.19°
DOF	12.4mm
F#	F8
Resolution	18μm
Image side MTF	>0.3@155lp/mm
Optical Distortion	<-0.051%

Measurement size:	2/3 8.8×6.6
	1/2 6.4×4.8
	1/3 4.8×3.6

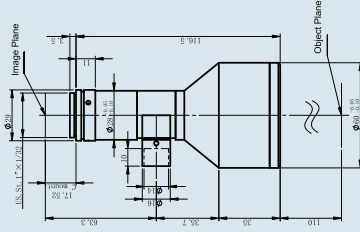


### XF-5MDT0.3X110D

#### Specifications

Optical structure	Object Telecentric
Magnification	0.3
Object FOV	φ38.7mm
Image FOV	φ11mm
W.D.	110mm±3%
Telescency	<-0.21°
DOF	6.8mm
F#	F7.5
Resolution	16.5μm
Image side MTF	>0.3@135lp/mm
Optical Distortion	<-0.02%

Measurement size:	2/3 8.8×6.6
	1/2 6.4×4.8
	1/3 4.8×3.6

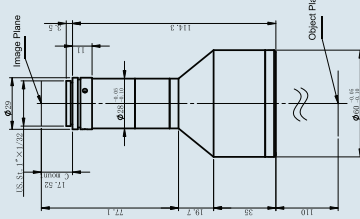


### XF-5MDT0.3X110

#### Specifications

Optical structure	Object Telecentric
Magnification	0.3
Object FOV	φ38.7mm
Image FOV	φ11mm
W.D.	110mm
Telescency	<-0.21°
DOF	6.8mm
F#	F7.5
Resolution	16.5μm
Image side MTF	>0.3@135lp/mm
Optical Distortion	<-0.01%

Measurement size:	2/3 8.8×6.6
	1/2 6.4×4.8
	1/3 4.8×3.6

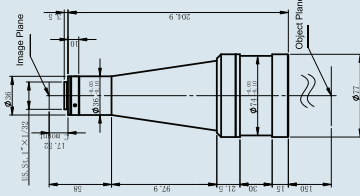


### XF-5MDT0.2X150

#### Specifications

Optical structure	Bi-telecentric
Magnification	0.2
Object FOV	φ55mm
Image FOV	φ11mm
W.D.	150mm±3%
Telescency	<-0.039°
DOF	2.1mm
F#	F8
Resolution	26.4μm
Image side MTF	>0.3@175lp/mm
Optical Distortion	<-0.03%

Measurement size:	44×33mm
	32×24mm
	24×18mm

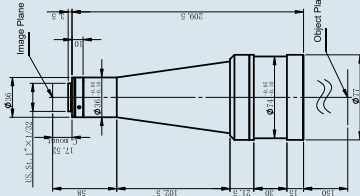


### XF-5MDT0.22X150

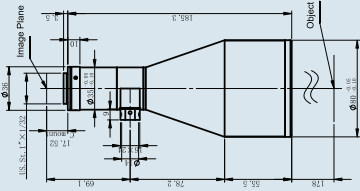
#### Specifications

Optical structure	Bi-telecentric
Magnification	0.22
Object FOV	φ50mm
Image FOV	φ11mm
W.D.	150mm±3%
Telescency	<-0.032°
DOF	17.4mm
F#	F8
Resolution	24.1μm
Image side MTF	>0.3@175lp/mm
Optical Distortion	<-0.03%

Measurement size:	2/3 8.8×6.6
	1/2 6.4×4.8
	1/3 4.8×3.6

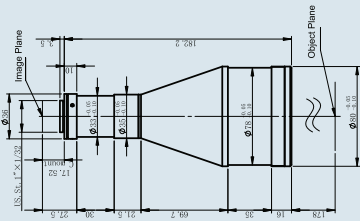


### XF-5MDT0.2X178D



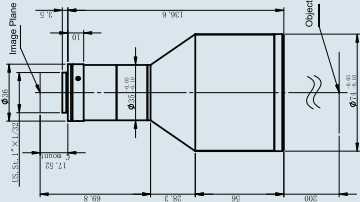
Specifications	
Optical structure	Bi-telecentric
Magnification	0.2
Object FOV	Ø55mm
Image FOV	Ø11mm
W.D.	178mm±3%
Telecentricity	<-0.48°
DOF	15.5mm
F#	F8
Resolution	19.9µm
Image side MTF	>0.3@175lp/mm
Optical Distortion	<-0.045%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.2X178



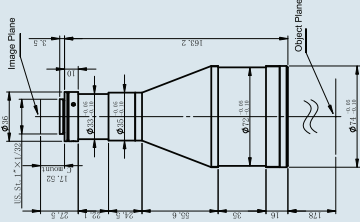
Specifications	
Optical structure	Bi-telecentric
Magnification	0.2
Object FOV	Ø55mm
Image FOV	Ø11mm
W.D.	178mm±3%
Telecentricity	<-0.48°
DOF	15.5mm
F#	F8
Resolution	19.9µm
Image side MTF	>0.3@175lp/mm
Optical Distortion	<-0.045%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.16X200



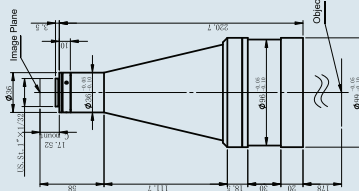
Specifications	
Optical structure	Object Telecentric
Magnification	0.16
Object FOV	Ø51.3mm
Image FOV	Ø8.2mm
W.D.	200mm±3%
Telecentricity	<-0.44°
DOF	22mm
F#	F6
Resolution	24.8µm
Image side MTF	>0.3@175lp/mm
Optical Distortion	<-0.035%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.145X178



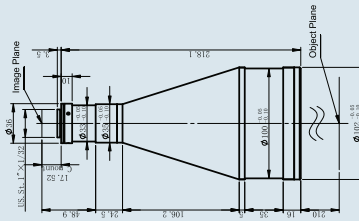
Specifications	
Optical structure	Bi-Telecentric
Magnification	0.145
Object FOV	Ø55.2mm
Image FOV	Ø8mm
W.D.	178mm±3%
Telecentricity	<-0.26°
DOF	33.5mm
F#	F6
Resolution	39.1µm
Image side MTF	>0.3@150lp/mm
Optical Distortion	<-0.06%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.18X178



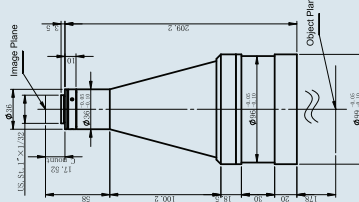
Specifications	
Optical structure	Bi-telecentric
Magnification	0.18
Object FOV	Ø51.1mm
Image FOV	Ø11mm
W.D.	178mm±3%
Telecentricity	<-0.031°
DOF	26mm
F#	F8
Resolution	30µm
Image side MTF	>0.3@130lp/mm
Optical Distortion	<-0.055%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.095X210



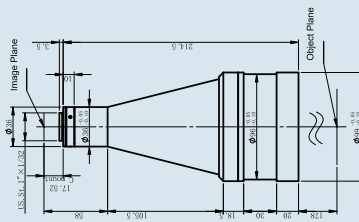
Specifications	
Optical structure	Bi-telecentric
Magnification	0.095
Object FOV	Ø84.2mm
Image FOV	Ø8mm
W.D.	210mm±3%
Telecentricity	<-0.37°
DOF	35mm
F#	F6
Resolution	44.6µm
Image side MTF	>0.3@175lp/mm
Optical Distortion	<-0.06%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.14X178



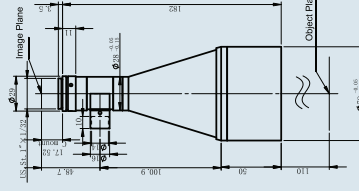
Specifications	
Optical structure	Bi-Telecentric
Magnification	0.14
Object FOV	Ø78.6mm
Image FOV	Ø11mm
W.D.	178mm±3%
Telecentricity	<-0.031°
DOF	43.2mm
F#	F8
Resolution	37.9µm
Image side MTF	>0.3@130lp/mm
Optical Distortion	<-0.06%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.16X178



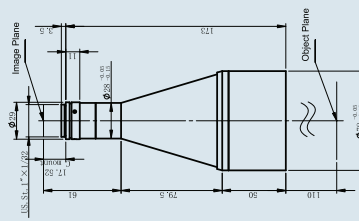
Specifications	
Optical structure	Bi-Telecentric
Magnification	0.16
Object FOV	Ø88.8mm
Image FOV	Ø11mm
W.D.	178mm±3%
Telecentricity	<-0.029°
DOF	33mm
F#	F8
Resolution	33µm
Image side MTF	>0.3@130lp/mm
Optical Distortion	<-0.06%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.18X110D



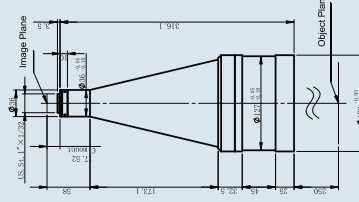
Specifications	
Optical structure	Object Telecentric
Magnification	0.18
Object FOV	Ø61.1mm
Image FOV	Ø11mm
W.D.	110mm±3%
Telecentricity	<-0.73°
DOF	24mm
F#	F6
Resolution	27.9µm
Image side MTF	>0.3@165lp/mm
Optical Distortion	<-0.04%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.18X110



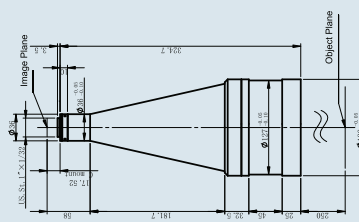
Specifications	
Optical structure	Object Telecentric
Magnification	0.18
Object FOV	Ø61.1mm
Image FOV	Ø11mm
W.D.	110mm
Telecentricity	<-0.64°
DOF	24mm
F#	F6
Resolution	27.9µm
Image side MTF	>0.3@165lp/mm
Optical Distortion	<-0.05%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.1X250



Specifications	
Optical structure	Bi-Telecentric
Magnification	0.1
Object FOV	Ø110mm
Image FOV	Ø11mm
W.D.	250mm±3%
Telecentricity	<-0.036°
DOF	68mm
F#	F8
Resolution	52.8µm
Image side MTF	>0.3@130lp/mm
Optical Distortion	<-0.05%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

### XF-5MDT0.12X250



Specifications	
Optical structure	Bi-Telecentric
Magnification	0.12
Object FOV	Ø91.7mm
Image FOV	Ø11mm
W.D.	250mm±3%
Telecentricity	<-0.037°
DOF	58mm
F#	F8
Resolution	43.7µm
Image side MTF	>0.3@130lp/mm
Optical Distortion	<-0.04%
Measurement size:	
2/3	8.8×6.6
1/2	6.4×4.8
1/3	4.8×3.6

