

μ·TRON
JAPAN



MACHINE VISION

LENS · LIGHTING · OPTICAL ACCESSORIES

2021 General Catalogue

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LENS SERIES





Super High Resolution of 3.5x Lens for Line Sensor Camera

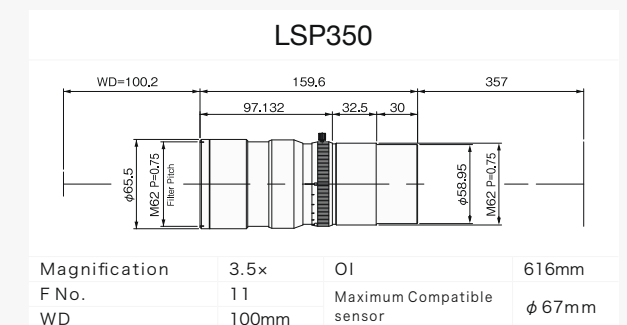
Suitable for the inspection in high accuracy such as LCD, TFT, and wafer



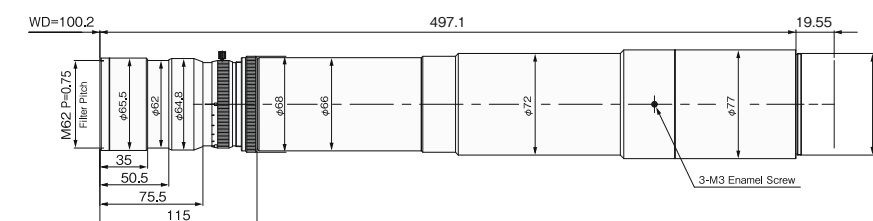
Display : WD (Magnification)														
Model No.	Image Circle	∞	0.3x	0.4x	0.5x	0.6x	0.7x	0.8x	0.9x	1x	1.5x	2x	3.5x	Page
LS05	φ36				188mm (0.5x)									P15
LS07	φ36						151mm (0.7x)							P15
LS10	φ36									123mm (1.0x)				P15
LS15	φ36										102mm (1.5x)			P15
LSP350	φ67												100mm (3.5x)	P7
UL035	φ67		367mm (0.35x)											P8
UL05	φ67				270mm (0.5x)									P8
UL07	φ67						204mm (0.7x)							P8
UL10	φ67									132mm (1.0x)				P8
SP05	φ67				276mm (0.5x)									P9
SP07	φ67						211mm (0.7x)							P9
SP10	φ67									165mm (1.0x)				P9
SP14	φ86										112mm (1.4x)			P9
SP20	φ100											90mm (2.0x)		P9
XLS03	φ90	680mm (0.2x)	477mm (0.3x)	376mm (0.4x)										P11
XLS05	φ90			386mm (0.4x)	324mm (0.5x)	274mm (0.625x)								P11
XLS075	φ90					279mm (0.625x)	246mm (0.75x)	222mm (0.875x)						P11
XLS10	φ90							215mm (0.875x)			197mm (1.0x)	177mm (1.2x)		P11
XLS14	φ90									185mm (1.2x)	170mm (1.4x)	154mm (1.7x)		P11
XLS20	φ90										157mm (1.7x)	146mm (2.0x)	133mm (2.5x)	P11

Display : WD (Magnification)													
Model No.	Image Circle	∞	0.05x	0.1x	0.15x	0.2x	0.25x	0.3x	0.35x	0.4x	0.45x	0.5x	Page
MS1828	φ30.7	713mm (0.025x)			100mm (0.15x)								P21
MS2524	φ30.7	999mm (0.025x)				120mm (0.2x)							P21
MS3520	φ30.7	1,429mm (0.025x)								100mm (0.39x)			P21
LSF2528	φ44	1,000mm (0.025x)			142mm (0.15x)								P18
LSF3528	φ44	1,413mm (0.025x)			223mm (0.15x)								P18
LSF5028	φ44	2066mm (0.025x)						178mm (0.3x)					P18
LSF10528	φ48	4392mm (0.025x)						433mm (0.3x)					P19
LSF20035	φ48	7980mm (0.025x)						851mm (0.3x)					P19
FV3526L	φ36		507mm (0.07x)			178mm (0.2x)							P23
FV5026L	φ45			521mm (0.1x)		246mm (0.22x)							P23
FV5026W	φ45	2,063mm (0.025x)				297mm (0.18x)							P24
HB5014	φ45	2,058mm (0.025x)				266mm (0.2x)							P25
WF5045	φ62	2,070mm (0.025x)				276mm (0.2x)							P17
FV8528L	φ62			1,000mm (0.09x)						250mm (0.4x)			P23
FV8528W	φ67	3,423mm (0.025x)				463mm (0.2x)							P24
XLS01	φ82	3,345mm (0.025x)			705mm (0.125x)								P12
XLS02	φ82			705mm (0.125x)				315mm (0.3x)					P12

- ❖ Suitable for Area Sensor Camera 151 Mega Pixel-3.76μm
- ❖ Suitable for Line Sensor Camera such as 16K x 3.5μm and 8K x 7μm
- ❖ Maximum compatible sensor is φ67mm
- ❖ Long working distance, WD100mm
- ❖ Reduce relative illumination and excellent uniformity
- ❖ F and M72 mount are available



Dimension of LSP350 + M Mount (M72x0.75 FB19.55mm)



* Example of camera mount. * Indicated Specifications are design values.

□□□□□□

LARGE
FORMAT

151MP

φ67

151Mega Pixel Super High Resolution Lens

Large Format φ67mm



- Suitable for Area Sensor Camera 151 Mega Pixel-3.76μm、127 Mega Pixel-3.45um , 120 Mega Pixel-2.2μm,and Line Sensor Camera 16K x3.5μm
- Super high resolution, Low distortion, excellent uniformity of brightness and resolution
- Low color aberration, compatible 3-line camera
- F and M72 mount are available

UL035

Magnification	0.35x	OI	556.9mm
F No.	5.8	Optical Distortion	-0.01%
Object side NA	0.030	Image Circle	φ 67mm
WD	366.5mm	Mount	F, M72

UL05

Magnification	0.5 x	OI	475.2mm
F No.	6.0	Optical Distortion	0.01%
Object side NA	0.042	Image Circle	φ 67mm
WD	270.4mm	Mount	F, M72

UL07

Magnification	0.7 x	OI	418mm
F No.	3.5 / (6.0)	Optical Distortion	0.01%
Object side NA	0.058	Image Circle	φ 67mm
WD	203.6mm	Mount	F, M72

UL10

Magnification	1.0 x	OI	398.4mm
F No.	6.0	Optical Distortion	0.00%
Object side NA	0.083	Image Circle	φ 67mm
WD	132.1mm	Mount	F, M72

* Indicated Specifications are design values.

□□□□□□

LARGE
FORMAT

φ67-100

Super High Resolution Lens for 16K x 3.5μm and 8K x 7μm Line Sensor Camera

Suitable for high speed and high-end applications



- Suitable for Line Sensor Camera such as 16K x 3.5μm and 8K x 7μm
- Reduce relative illumination and excellent uniformity
- Very low distortion
- Excellent brightness, ∞F No. 2.7
- F and M72 mount are available

SP05

Magnification	0.5x	OI	463mm
F No.	4.3	Maximum	φ 67mm
WD	276mm	Compatible sensor	

SP07

Magnification	0.7x	OI	421mm
F No.	5	Maximum	φ 67mm
WD	211mm	Compatible sensor	

SP10

Magnification	1.0x	OI	407mm
F No.	5.8	Maximum	φ 67mm
WD	165mm	Compatible sensor	

SP14

Magnification	1.4x	OI	419mm
F No.	6.8	Maximum	φ 86mm
WD	112mm	Compatible sensor	

SP20

Magnification	2.0x	OI	463mm
F No.	8.6	Maximum	φ 100mm
WD	90mm	Compatible sensor	

Dimension of SP07 + H Mount (M72x0.75 FB6.56mm)

* Example of camera mount. * Indicated Specifications are design values.



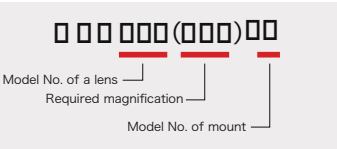
Line Sensor, Large Area Sensor Lens for Image Circle, φ90mm

Compatible with large image circle, up to φ90mm sensor

- Suitable for Line Sensor Camera such as 16K x 5um, 23K x 3.5um, 16K x 5um
- Suitable for large Area Sensor Camera of high resolution such as 65 Mega Pixel, 50 Mega pixel, and 25 Mega Pixel
- Reduce color aberration, suitable for 3 line sensor
- Excellent uniformity of brightness and resolution
- Possible to adjust ±0.05x from the original magnification by using the optional mount
- F, M95, M90, M84.5 and M72 mount are available

How to request if magnification is other than standard.

Ex.) 0.67x for F mount



* If a lens is not used at the standard magnification, adjustable range is not ±0.05x.
* Please select one of XLS series which magnification is the closest from required magnification.



Model No. for Different Mount

Model	Compatible Camera	Screw Pitch	Flange Back
XLS□□□-F	F Mount Camera	F Mount	46.5mm
XLS□□□-E	TELEDYNE e2V	M95 (P=1)	9.4mm
XLS□□□-DX	TELEDYNE DALSA	M90 (P=1)	12mm
XLS□□□-Q	NED	M84.5 (P=0.5)	41mm
XLS□□□-N	NED	M72 (P=0.75)	31.8mm
XLS□□□-M	TELEDYNE DALSA/TAKEX	M72 (P=0.75)	19.55mm
XLS□□□-D	TELEDYNE DALSA	M72 (P=0.75)	12mm
XLS□□□-VW	VIEWWORKS	M72 (P=0.75)	10.48mm

* ±0.05x can be adjusted from the standard magnification by using the mount mentioned above.
* Customized mount is also available. Please contact us for further information.

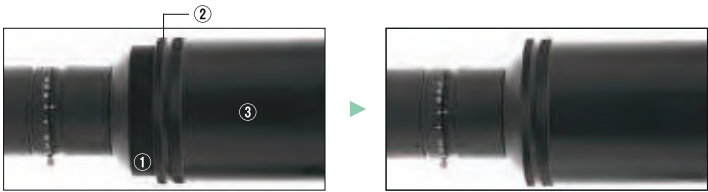
XLS03 Magnification 0.3x ∞F No. 4.7 F No. 6.0 WD 477mm OI 666mm Maximum Compatible sensor φ 90mm	XLS05 Magnification 0.5x ∞F No. 4.7 F No. 7.0 WD 324mm OI 540mm Maximum Compatible sensor φ 90mm	XLS075 Magnification 0.75x ∞F No. 4.7 F No. 8.1 WD 246mm OI 491mm Maximum Compatible sensor φ 90mm
XLS10 Magnification 1.0x ∞F No. 4.7 F No. 9.0 WD 197mm OI 465mm Maximum Compatible sensor φ 90mm	XLS14 Magnification 1.4x ∞F No. 4.7 F No. 11.4 WD 170mm OI 494mm Maximum Compatible sensor φ 90mm	XLS20 Magnification 2.0x ∞F No. 4.7 F No. 14.5 WD 146mm OI 540mm Maximum Compatible sensor φ 90mm

Example of lens with mount (XLS05)

XLS05-F WD=324.1, 70, 215.6, 145.6, 46.5, 49.6, 57.5, 78	XLS05-E WD=324.1, 70, 215.6, 145.6, 9.4, 31.8, 38.5, 41	XLS05-DX WD=324.1, 70, 215.6, 145.6, 12, 31.8, 38.5, 41
XLS05-Q WD=324.1, 70, 215.6, 145.6, 41, 31.8, 38.5, 41	XLS05-N WD=324.1, 70, 215.6, 145.6, 31.8, 31.8, 38.5, 41	XLS05-VW WD=324.1, 70, 215.6, 145.6, 10.48, 31.8, 38.5, 41

How to adjust magnification

- Mount tube is composed by three mechanical parts ①, ②, and ③.
- Magnification increases by extending the mount and decreases by shortening.



* Indicated Specifications are design values.

LINE SENSOR LENS / LARGE AREA SENSOR LENS



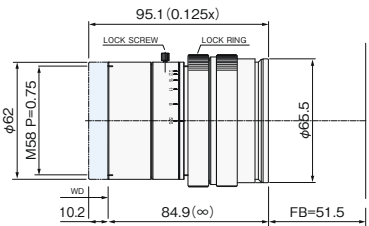
Area Sensor and Line Sensor Lens for 151 Mega Pixel and 16K x 5μm

XLS Series for Large Field of View

- Compatible with large image circle, φ82mm
- Suitable for Area Sensor Camera, 151 Mega Pixel, and Line Sensor Camera such as 16K x 5μm, 16K x 3.5μm
- Adjustable magnification by lock ring
- Design for wide angle, suitable for large field of view in limited space
- Excellent uniformity and very low distortion
- F, M95, M90, M84.5 and M72 mount are available



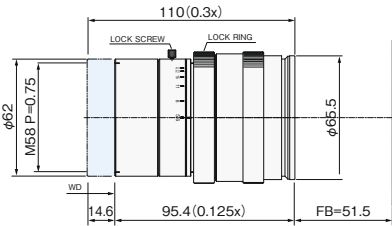
XLS01



Magnification	∞-0.125x	Optical distortion	-0.02%
∞FNO	5.6	Maximum Compatible sensor	φ 82mm
Range of WD	∞-705mm		

* Indicated Specifications are design values.

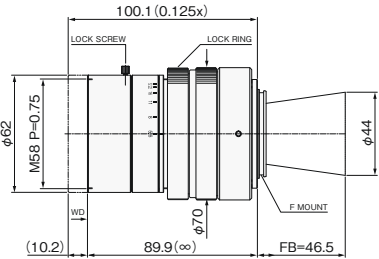
XLS02



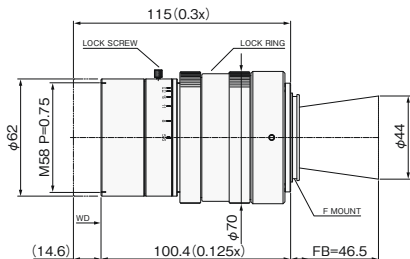
Magnification	0.125x-0.3x	Optical distortion	-0.02%
∞FNO	5.6	Maximum Compatible sensor	φ 82mm
Range of WD	705mm-315mm		

Example of lens with mount (XLS01/XLS02)

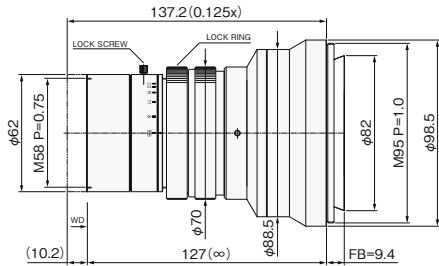
XLS01-F



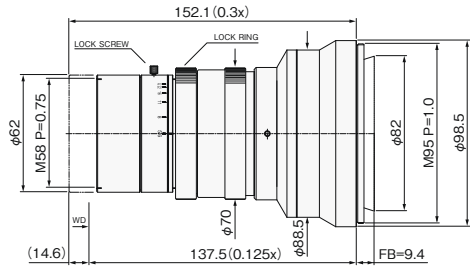
XLS02-F



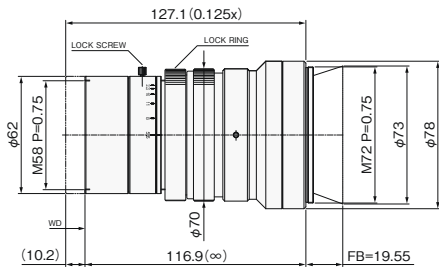
XLS01-E



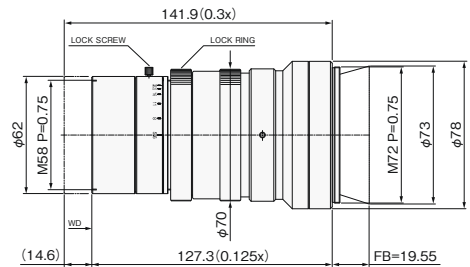
XLS02-E



XLS01-M



XLS02-M



Model No. for Different Mount

Model	Compatible Camera	Screw Pitch	Flange Back
XLS□□□-F	F Mount Camera	F Mount	46.5mm
XLS□□□-E	TELEDYNE e2V	M95 (P=1)	9.4mm
XLS□□□-DX	TELEDYNE DALSA	M90 (P=1)	12mm
XLS□□□-Q	NED	M84.5 (P=0.5)	41mm
XLS□□□-N	NED	M72 (P=0.75)	31.8mm
XLS□□□-M	TELEDYNE DALSA/TAKEX	M72 (P=0.75)	19.55mm
XLS□□□-D	TELEDYNE DALSA	M72 (P=0.75)	12mm
XLS□□□-VW	VIEWWORKS	M72 (P=0.75)	10.48mm

* ±0.05x can be adjusted from the standard magnification by using the mount mentioned above.
* Customized mount is also available. Please contact us for further information.

How to adjust magnification, focus

- To adjust the focus, at first loosening ②, and rolling ①.
 - By loosening ②, to change magnification.
- ※ XLS01 = ∞~0.125x XLS02 = 0.125x~0.3x



In case of low magnification



In case of high magnification

* Indicated Specifications are design values.



LARGE
FORMAT

φ22.6-36

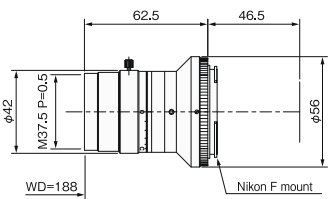
Compact Macro Lens for Large format

High Resolution and high contrast
Suitable for LCD, film, and PCB inspection

- Excellent uniformity
- High resolution from the center to the edge of image
- Compact design
- High durability
- Optical distortion less than 0.1%
- C mount type is suitable for area sensor, 4/3"

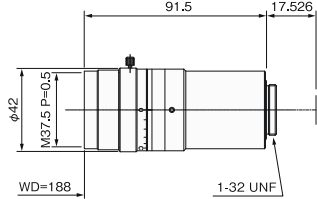


LS05F (F Mount)



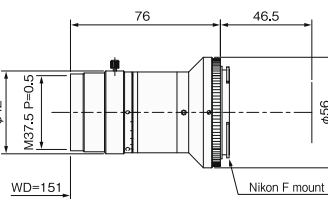
Magnification	0.5×	Resolution	11 μ
WD	188mm	Optical distortion	-0.01%
Depth of field	0.94mm	Maximum Compatible sensor	φ 36mm
F No.	5.1	Mount	F

LS05C (C Mount)



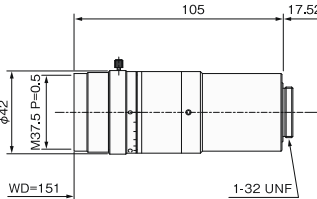
Magnification	0.5×	Resolution	11 μ
WD	188mm	Optical distortion	-0.01%
Depth of field	0.94mm	Maximum Compatible sensor	4/3 (φ 22.6mm)
F No.	5.1	Mount	C

LS07F (F Mount)



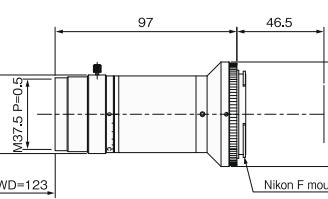
Magnification	0.7×	Resolution	10 μ
WD	151mm	Optical distortion	-0.07%
Depth of field	0.54mm	Maximum Compatible sensor	φ 36mm
F No.	6	Mount	F

LS07C (C Mount)



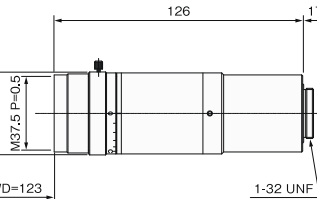
Magnification	0.7×	Resolution	10 μ
WD	151mm	Optical distortion	-0.07%
Depth of field	0.54mm	Maximum Compatible sensor	4/3 (φ 22.6mm)
F No.	6	Mount	C

LS10F (F Mount)



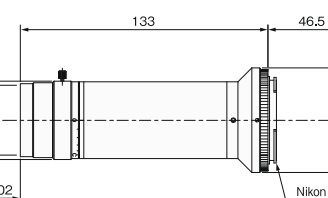
Magnification	1.0×	Resolution	8 μ
WD	123mm	Optical distortion	-0.01%
Depth of field	0.31mm	Maximum Compatible sensor	φ 36mm
F No.	7.5	Mount	F

LS10C (C Mount)



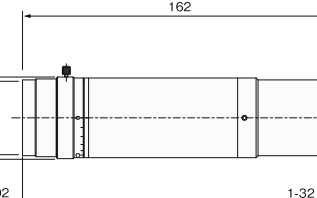
Magnification	1.0×	Resolution	8 μ
WD	123mm	Optical distortion	-0.01%
Depth of field	0.31mm	Maximum Compatible sensor	4/3 (φ 22.6mm)
F No.	7.5	Mount	C

LS15F (F Mount)



Magnification	1.5×	Resolution	7 μ
WD	102mm	Optical distortion	0.26%
Depth of field	0.17mm	Maximum Compatible sensor	φ 36mm
F No.	9.9	Mount	F

LS15C (C Mount)



Magnification	1.5×	Resolution	7 μ
WD	102mm	Optical distortion	0.26%
Depth of field	0.17mm	Maximum Compatible sensor	4/3 (φ 22.6mm)
F No.	9.9	Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at wavelength of 550nm.
* Depth of field is calculated assuming F No. 22 and resolution of 7μm camera.



High Resolution and Wide View Lens for φ62mm

Suitable for wide field of view in limited space

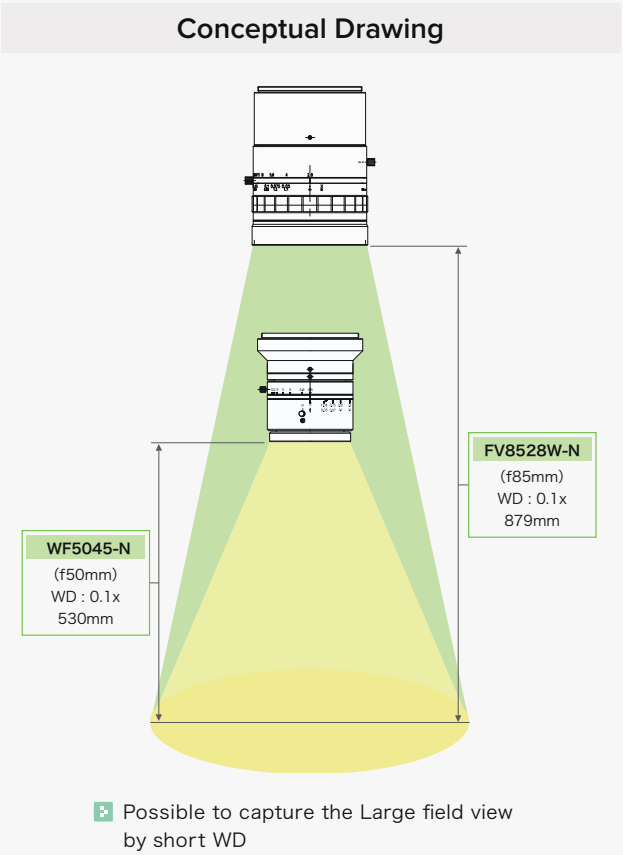
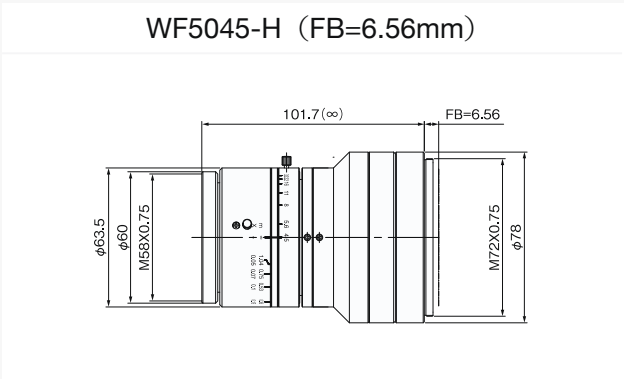
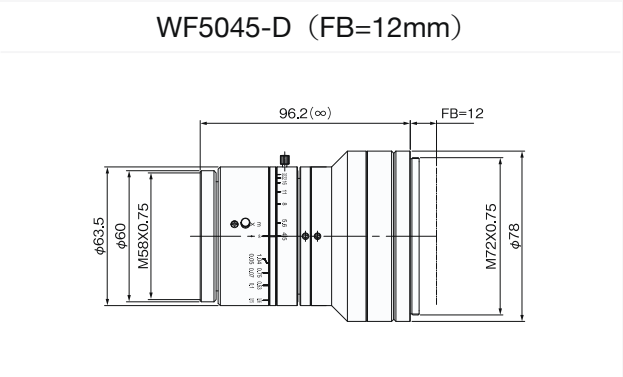
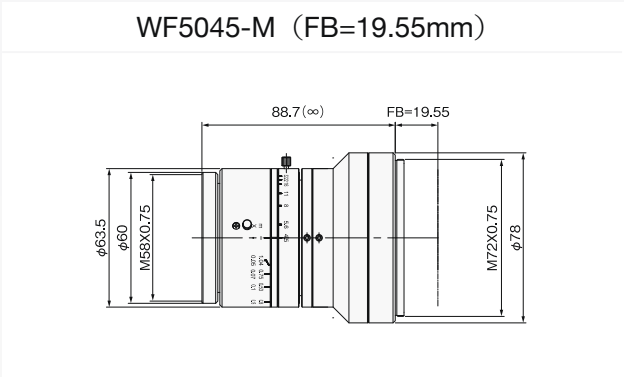
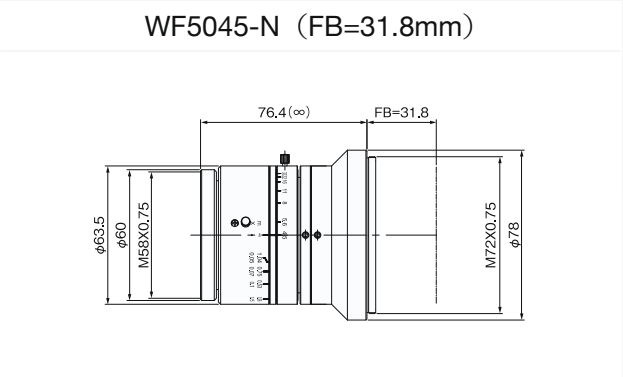
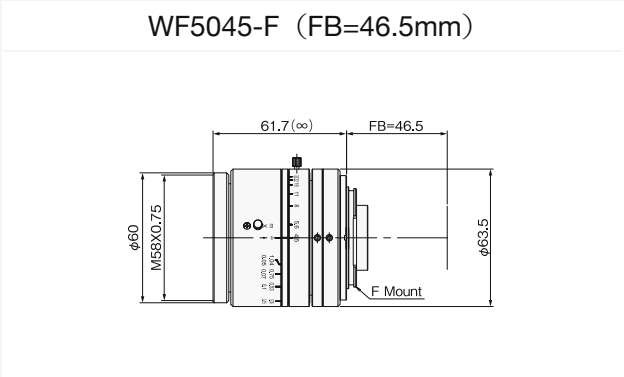
- f50mm is available
- The widest angle for φ62mm in machine vision industry
- Suitable for Line Sensor Camera such as 16K x 3.5μm, 12K x 5μm, 8K x 7μm
- Possible to capture the large field of view by one camera in limited space
- F and M72 mount are available

WF5045- □			
Focal length	50mm	Optical distortion	-0.01%
∞ F No.	4.5	Maximum Compatible sensor	φ 62.5mm
Range of WD	266mm - ∞	Mount	M72 or F
Magnification at M0D	0.2x		



Model No. for Different Mount			
Model	Compatible Camera	Screw Pitch	Flange Back
WF5045 -F	F Mount Camera	F Mount	46.5mm
WF5045-N	NED	M72 (P=0.75)	31.8mm
WF5045-M	TELEDYNE DALSA/TAKEX	M72 (P=0.75)	19.55mm
WF5045-D	TELEDYNE DALSA	M72 (P=0.75)	12mm
WF5045-VW	VIEWWORKS	M72 (P=0.75)	10.48mm

* Customized mount is also available. Please contact us for further information.



Possible to capture the Large field view by short WD

□□□□□□□□

LARGE
FORMAT
φ44

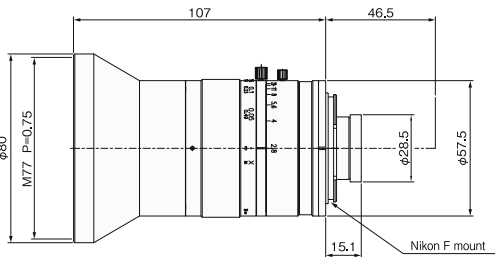
High Resolution and Wide View Lens for Area and Line Sensor Camera

Excellent relative illumination
High resolution at whole working distance



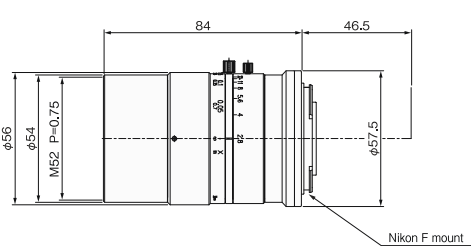
- Design for high resolution and low distortion, stable performance at whole working distance
- Suitable for Large Area Sensor Camera such as 25 Mega Pixel and 20 Mega Pixel
- Possible to use for small pixel size, 3.5μm
- Very low color aberration, compatible with 3-line camera
- 「LSF5028-F」 is possible to use at 0.3x without extension ring
- F, M58, M48 and M42 mount are available

LSF2528-F



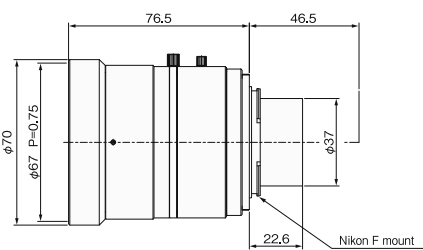
Focal length	25mm	Optical distortion	0.66%
∞ F No.	2.8	Maximum Compatible sensor	φ 44mm
Range of WD	142mm - ∞	Mount	F
Magnification at MOD	0.15x		

LSF3528-F



Focal length	35mm	Optical distortion	-0.31%
∞ F No.	2.8	Maximum Compatible sensor	φ 44mm
Range of WD	223mm - ∞	Mount	F
Magnification at MOD	0.15x		

LSF5028-F



Focal length	50mm	Optical distortion	-0.40%
∞ F No.	2.8	Maximum Compatible sensor	φ 44mm
Range of WD	178mm - ∞	Mount	F
Magnification at MOD	0.3x		

Model No. for Different Mount

Model	Compatible Camera	Screw Pitch	Flange Back
LSF□□□□-V58	SVS	M58 (P = 0.75)	11.48mm
LSF□□□□-U58	BAUMER	M58 (P = 0.75)	12mm
LSF□□□□-TFL II	TOSHIBA TELI, ADIMEC	M48(P=0.75)	17.5mm
LSF□□□□-B42	BASLER	M42 (P = 1)	16mm
LSF□□□□-B42/2	BASLER	M42 (P = 0.75)	16mm
LSF□□□□-D42/2	TELEDYNE DALSA	M42 (P = 1)	12mm
LSF□□□□-V42	SVS	M42 (P = 1)	11.48mm
LSF□□□□-S42	SENTECH	M42 (P = 1)	10mm
LSF□□□□-D42	TELEDYNE DALSA	M42 (P = 1)	6.56mm

* Indicated Specifications are design values.

□□□□□□□□

LARGE
FORMAT
φ48

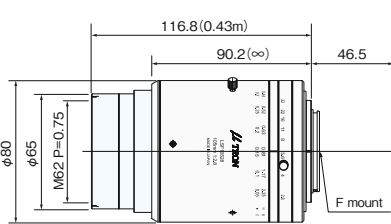
Long Focal High Resolution Lens for φ48mm

High Sensitivity CMOS sensor



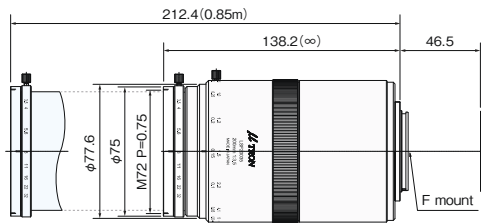
- Long focal distance, f105mm and f200mm
- Suitable for 65 Mega Pixel, 50 Mega Pixel, and 31 Mega Pixel
- Possible to use for small pixel size, 3.2μm
- Magnification at MOD 0.3x
- Stable performance at different WD by floating design
- F, M58, and M42 mount are available

LSF10528-F



Focal length	105mm
∞ F No.	2.8
Range of WD	433mm ~ ∞
Magnification at MOD	0.3x
TV distortion	0.10%
Maximum Compatible sensor	φ 48mm
Mount	F

LSF20035-F



Focal length	200mm
∞ F No.	3.5
Range of WD	850mm ~ ∞
Magnification at MOD	0.3x
TV distortion	0.14%
Maximum Compatible sensor	φ 48mm
Mount	F

* Indicated Specifications are design values.



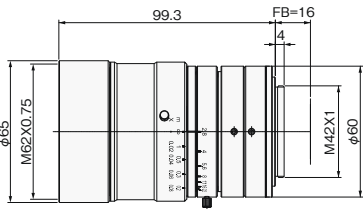
31 Mega Pixel Lens for Large format, Φ30mm

High resolution lens for 31 Mega Pixel

- Suitable for large format, 31 Mega Pixel – 3.45μm and Line Sensor Camera , 8K x 3.5μm
- Adopt screw mount, stable mount mechanism without rattling
- Achieve low distortion and wide angle for large format, Φ30.7mm
- Stable performance at different working distance by floating design
- M48, M42 and M35 mount are available



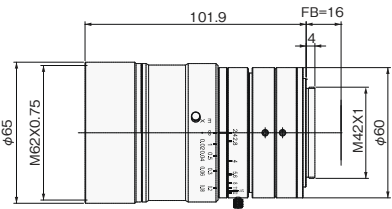
MS1828- □



Focal length	18mm	Magnification at MOD	0.15x
∞F No.	2.8	TV distortion	0.52%
Range of WD	97mm - ∞	Maximum Compatible sensor	Φ 30.7
Mount	M42,TFL- II ,TFL		

* Drawing is for B42 mount (M42 x 1, FB16mm)
* Indicated specifications are design value. * □ = Mount

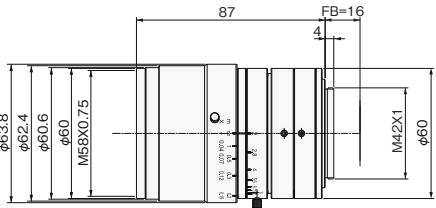
MS2524- □



Focal length	25mm	Magnification at MOD	0.2x
∞F No.	2.4	TV distortion	-0.27%
Range of WD	118mm - ∞	Maximum Compatible sensor	Φ 30.7
Mount	M42,TFL- II ,TFL		

* Drawing is for B42 mount (M42 x 1, FB16mm)
* Indicated specifications are design value. * □ = Mount

MS3520- □



Focal length	35mm	Magnification at MOD	0.39x
∞F No.	2.0	TV distortion	-0.11%
Range of WD	93mm - ∞	Maximum Compatible sensor	Φ 30.7
Mount	M42,TFL- II ,TFL		

* Drawing is for B42 mount (M42 x 1, FB16mm)
* Indicated specifications are design value. * □ = Mount

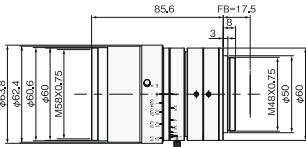
Model No. for Different Mount

Model	Compatible Camera	Screw Pitch	Flange Back
MS□□□□-TFL II	TOSHIBA TELI, ADIMEC	M48 P=0.75mm	17.5mm
MS□□□□-B42	BASLER	M42 P=1mm	16mm
MS□□□□-D42/2	TELEDYNE DALSA	M42 P=1mm	12mm
MS□□□□-V42	SVS	M42 P=1mm	11.48mm
MS□□□□-S42	SENTECH	M42 P=1mm	10mm
MS□□□□-D42	TELEDYNE DALSA	M42 P=1mm	6.56mm
MS□□□□-TFL	LUCID	M35 P=0.75mm	17.526mm

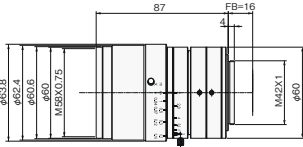
* Possible to customize the mount

Example of lens with mount (MS3520)

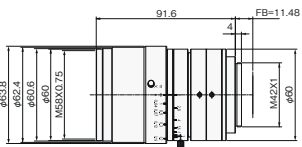
MS3520-TFL II



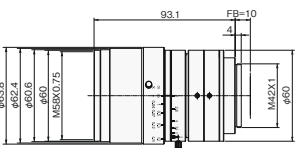
MS3520-B42



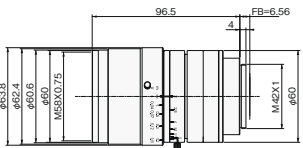
MS3520-V42



MS3520-S42



MS3520-D42



□□□□□□□□

LARGE
FORMAT

φ22.6-62

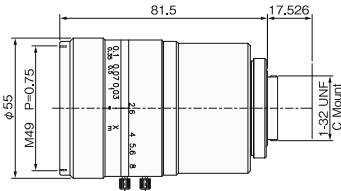
Macro Lens for Area and Line Sensor Camera

Design for macro imaging, suitable for large area and line scan camera

- Adjustable focus and iris
- Design for macro imaging
- Suitable for inspection of wafer, PCB, electronic parts, etc..., required for high resolution at short working distance
- FV8528L is compatible with M72 mount
- Compatible with large image format of high resolution area camera

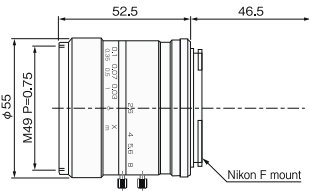


FV3526L-C



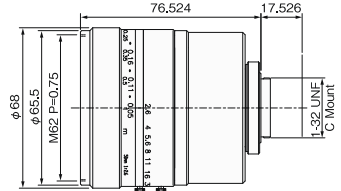
Focal length	35mm	Optical distortion	-0.05%
∞F No.	2.6	Maximum Compatible sensor	4/3" (φ 22.6mm)
Range of WD	0.18m - ∞	Mount	C
Magnification at MOD	0.2x		

FV3526L-F



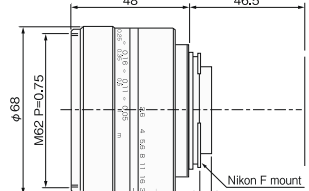
Focal length	35mm	Optical distortion	-0.42%
∞F No.	2.6	Maximum Compatible sensor	φ 36mm
Range of WD	0.18m - ∞	Mount	F
Magnification at MOD	0.2x		

FV5026L-C



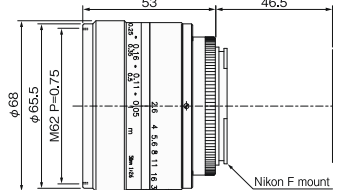
Focal length	50mm	Optical distortion	-0.01%
∞F No.	2.6	Maximum Compatible sensor	4/3" (φ 22.6mm)
Range of WD	0.25m - 1m	Mount	C
Magnification at MOD	0.22x		

FV5026L-F



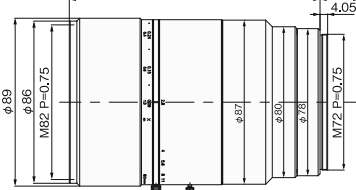
Focal length	50mm	Optical distortion	-0.24%
∞F No.	2.6	Maximum Compatible sensor	φ 45mm
Range of WD	0.25 - 1m	Mount	F
Magnification at MOD	0.22x		

FV5026L II -F



Focal length	50mm	Optical distortion	-0.80%
∞F No.	2.6	Maximum Compatible sensor	φ 45mm
Range of WD	0.17m - 0.35m	Mount	F
Magnification at MOD	0.32x		

FV8528L- □



* Drawing is for FV8528L-M (M72 P=0.75 FB19.55mm)			
Focal length	85mm	Optical distortion	-0.18%
∞F No.	2.8	Maximum Compatible sensor	φ 62mm
Range of WD	0.25m - 1m	Mount	F or M72
Magnification at MOD	0.4x		

* Indicated specifications are design value. * □ = Mount

Model No. for Different Mount

Model	Compatible Camera	Screw Pitch	Flange Back
FV8528L -F	F Mount Camera	F Mount	46.5mm
FV8528L-N	NED	M72 (P=0.75)	31.8mm
FV8528L-M	TELEDYNE DALSA/TAKEX	M72 (P=0.75)	19.55mm
FV8528L-D	TELEDYNE DALSA	M72 (P=0.75)	12mm
FV8528L-VW	VIEWWORKS	M72 (P=0.75)	10.48mm

* Customized mount is also available. Please contact us for further information.



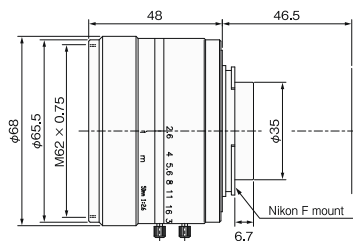
Wide Field of View Lens for Area and Line Sensor Camera

Design for Machine Vision application

- Adjustable focus and iris
- Design for infinite distance (∞), suitable for wide field of view
- f50mm and f85 mm are available
- FV8528W is compatible with M72 mount



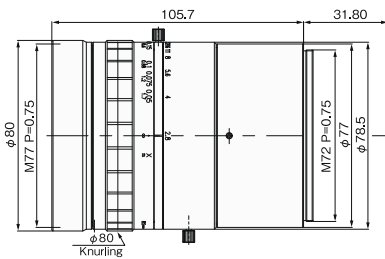
FV5026W-F



Focal length	50mm	Optical distortion	0.23%
∞ F No.	2.6	Maximum Compatible sensor	ϕ 45mm
Range of WD	0.32m - ∞	Mount	F
Magnification at MOD	0.18x		

* Indicated specifications are design value.

FV8528W- □



Focal length	85 mm	Optical distortion	0.04%
∞ F No.	2.8	Maximum Compatible sensor	ϕ 67mm
Range of WD	0.46m - ∞	Mount	F or M72
Magnification at MOD	0.2x		



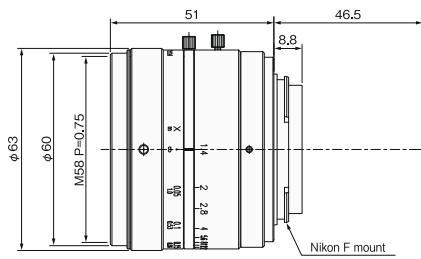
High brightness Lens for Line Sensor Camera

Excellent brightness, F No.1.4

- f50mm is available
- Suitable for high speed applications such as printing, food inspection, etc..
- Metal design, avoid aged deterioration of plastic and gum, concerned about photographic lenses
- Suitable for large image circle and high speed camera



HB5014-F



Focal length	50mm	Optical distortion	0.17%
∞ F No.	1.4	Maximum Compatible sensor	ϕ 45mm
Range of WD	0.27m - ∞	Mount	F
Magnification at MOD	0.2x		

* Indicated specifications are design values.

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Magnification chart of Telecentric Lens

VGA MEGA PIXEL 5 MEGA PIXEL 4-9 MEGA PIXEL 12-25 MEGA PIXEL Large Format

Magnification	Compatible Sensor											
	1/2	page	1/1.8	page	2/3	page	1	page	1.1	page	Large Format	page
0.12x	-		-		-		MGTL012V	P29	-		-	
0.132x	-		-		-		-		MGTL0132V	P29	-	
0.14x	MGTL014	P51	-		MGTL014VM	P47	-		-		-	
	-		-		MGTL014VM-180	P47	-		-		-	
0.15x	-		-		-		MGTL015V	P29	-		-	
0.164x	-		-		-		-		MGTL0164V	P29	-	
0.17x	-		-		MGTL017VM	P47	-		-		-	
0.19x	-		-		MGTL019	P51	-		-		-	
	-		-		MGTL019VM	P47	-		-		-	
0.2x	-		-		-		MGTL02V	P29	-		-	
0.22x	-		-		MGTL022VM	P47	-		MGTL022V	P29	LSTL022T-F	P31
0.23x	-		-		MGTL023	P51	-		-		-	
	-		-		MGTL023H	P48	-		-		-	
0.275x	-		-		MGTL0275-2	P51	MGTL0275V	P45	-		LSTL0275T-F	P31
0.3x	-		-		MGTL03	P51	-		MGTL03V	P44	LSTL03TW-F	P31
	-		-		MGTL03VM	P48	-		MGTL03VC	P44	-	
	-		-		MGTL03VMC	P49	-				-	
0.345x	-		-		MGTL0345VM	P48	-		MGTL0345V	P44	-	
	-		-		MGTL0345VMC	P49	-		-		-	
0.35x	-		-		-		-		-		LSTL035H-F	P33
0.366x	-		-		-		-		-		LSTL0366T-F	P31
0.37x	-		-		-		MGTL037V	P45	-		-	
0.4x	-		-		MGTL04	P51	-		-		-	
	-		-		MGTL04VM	P48	-		-		-	
	-		-		MGTL04VMC	P49	-		-		-	
0.5x	-		TL05C-220	P62	FT05-65R	P52	-		MGTL05-1.1	P51	LSTL05H-F	P33
	-		-		FT05C-65R	P53	-		FTV05-110	P35	-	
	-		-		FT05-110	P54	-		FTV05C-110	P36	-	
	-		-		FT05C-110	P55	-		FTV05-150	P38	-	
	-		-		MGTL05VM	P49	-		FTV05C-150	P39	-	
	-		-		MGTL05VMC	P49	-		-		-	
0.55x	-		-		-		-		-		LSTL055TW-F	P31
0.69x	-		-		MGTL069VM	P49	-		-		-	
	-		-		MGTL069VMC	P49	-		-		-	
0.7x	-		TL07C-220	P62	-		-		FTV07-110	P35	-	
	-		TL07C-340	P64	-		-		FTV07C-110	P36	-	
	-		-		-		-		FTV07-150	P38	-	
	-		-		-		-		FTV07C-150	P39	-	
0.78x	-		-		-		-		-		LSTL078TW-F	P31
0.8x	-		TL08-65R	P58	-		-		FTV08-110	P35	-	
	-		TL08C-65R	P59	-		-		FTV08C-110	P36	-	
	-		TL08-110R	P60	FT08-65R	P52	-		FTV08-150	P38	-	
	-		TL08C-110R	P61	FT08C-65R	P53	-		FTV08C-150	P39	-	
	-		-		FT08-110	P54	-		-		-	
	-		-		FT08C-110	P55	-		-		-	

Coaxial type is 'C' included on the model name

Magnification	Compatible Sensor											
	1/2	page	1/1.8	page	2/3	page	1	page	1.1	page	Large Format	page
1.0x	TL10C-40	P57	TL10-65R	P58	FT10-65R	P52	-		MGTL10V	P49	LSTL10H-F	P33
	-		TL10C-65R	P59	FT10C-65R	P53	-		MGTL10VC	P49	-	
	-		TL10-110R	P60	FT10-110	P54	-		FTV10-110	P35	-	
	-		TL10C-110R	P61	FT10C-110	P55	-		FTV10C-110	P36	-	
	-		TL10C-220	P62	TL10C-310	P64	-		FTV10-150	P38	-	
	-		-		-		-		FTV10C-150	P39	-	
	-		-		-		-		FTV10C-110SW	P41	-	
1.5x	-		TL15-65R	P58	FT15-65R	P52	-		FTV15-110	P35	LSTL15H-F	P33
	-		TL15C-65R	P59	FT15C-65R	P53	-		FTV15C-110	P36	-	
	-		-		FT15-110	P54	-		FTV15-150	P38	-	
2.0x	-		-		FT15C-110	P55	-		FTV15C-150	P39	-	
	TL20-40	P56	TL20C-220	P62	FT20-65R	P53	-		FTV20-110	P35	LSTL20H-F	P33
	TL20C-40	P57	-		FT20C-65R	P53	-		FTV20C-110	P36	-	
	TL20-65R	P58	-		FT20-110	P55	-		FTV20-150	P38	-	
	TL20C-65R	P59	-		FT20C-110	P55	-		FTV20C-150	P39	-	
	TL20-110R	P61	-		-		-		FTV20C-110SW	P41	-	
3.0x	TL20C-110R	P61	-		-		-		-		-	
	-		-		FT30-65R	P53	-		FTV30-110	P35	-	
	-		-		FT30C-65R	P53	-		FTV30C-110	P36	-	
	-		-		FT30-110R	P55	-		FTV30-150	P38	-	
	-		-		FT30C-110R	P55	-		FTV30C-150	P39	-	
4.0x	-		-		TL30C-110	P61	-		FTV30C-110SW	P41	-	
	TL40-40	P56	TL40C-110R	P61	TL40-65	P59	-		FTV40-110	P35	-	
	TL40C-40	P57	-		TL40C-65	P59	-		FTV40C-110	P36	-	
	-		-		FT40-65R	P53	-		FTV40-150	P38	-	
	-		-		FT40C-65R	P53	-		FTV40C-150	P39	-	
	-		-		FT40-110R	P55	-		FTV40C-110SW	P41	-	
	-		-		FT40C-110R	P55	-		-		-	
6.0x	-		-		TL40C-240	P63	-		-		-	
	TL60-40	P57	TL60C-110R	P61	FT60-65R	P53	-		FTV60-110	P35	-	
	TL60C-40	P57	-		FT60C-65R	P53	-		FTV60C-110	P36	-	
	-		-		FT60-110R	P55	-		FTV60-150	P38	-	
	-		-		FT60C-110R	P55	-		FTV60C-150	P39	-	
	-		-		TL60-65	P59	-		-		-	
	-		-		TL60C-65	P59	-		-		-	
8.0x	-		-		TL60C-240	P63	-		-		-	
	-		TL80C-110R	P61	TL80-65	P59	-		-		-	
	-		-		TL80C-65	P59	-		-		-	

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φ16-18.1

Low Magnification Telecentric Lens for Large 1"-1.1"

Suitable for F mount and C mount high resolution camera

- Suitable for 25 Mega Pixel and 12 Mega Pixel
- Designed for long working distance, 200mm that can secure enough space to set up
- Adjustable iris, possible to adjust depth of field and contrast
- Possible to capture wide view with large format, high resolution camera
- Flange adapter is available



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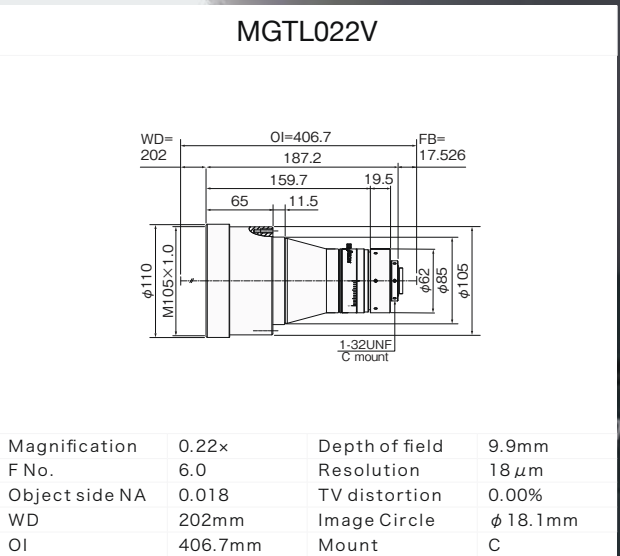
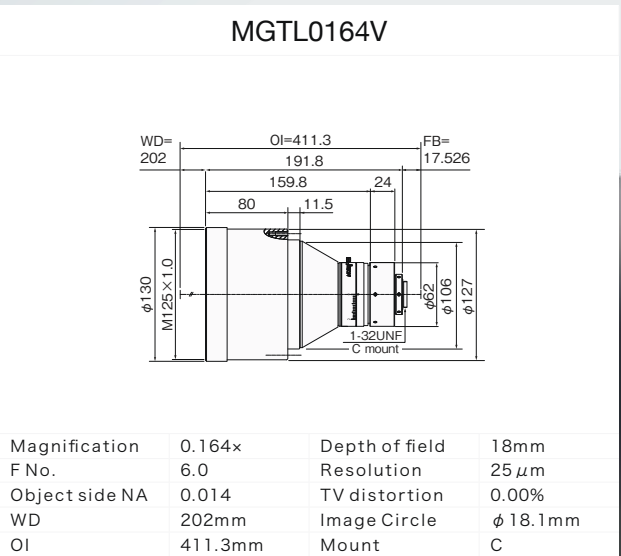
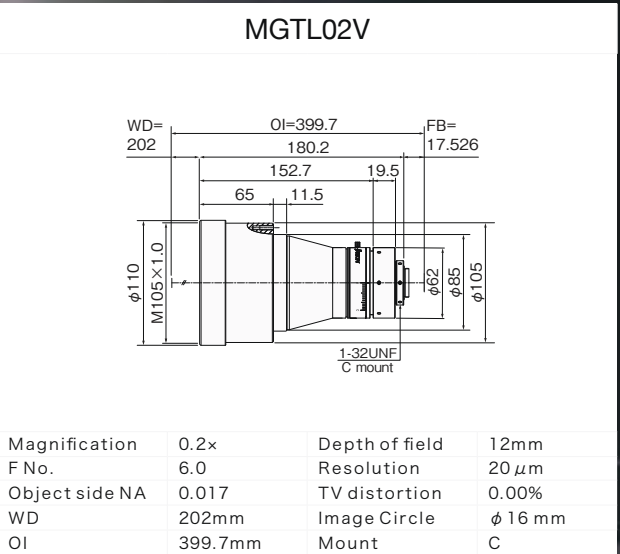
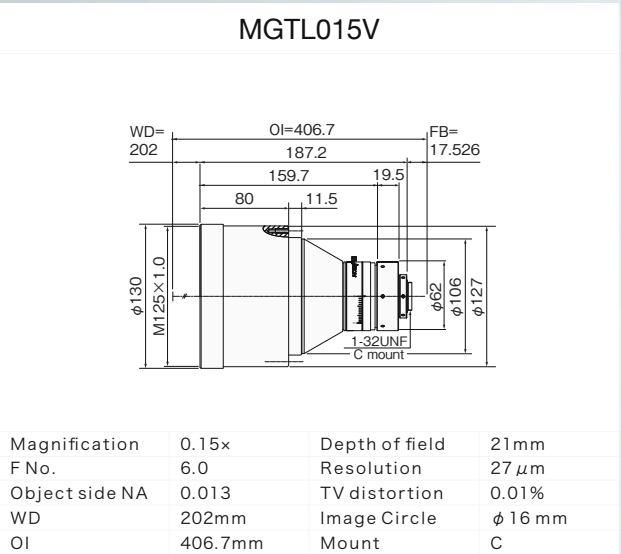
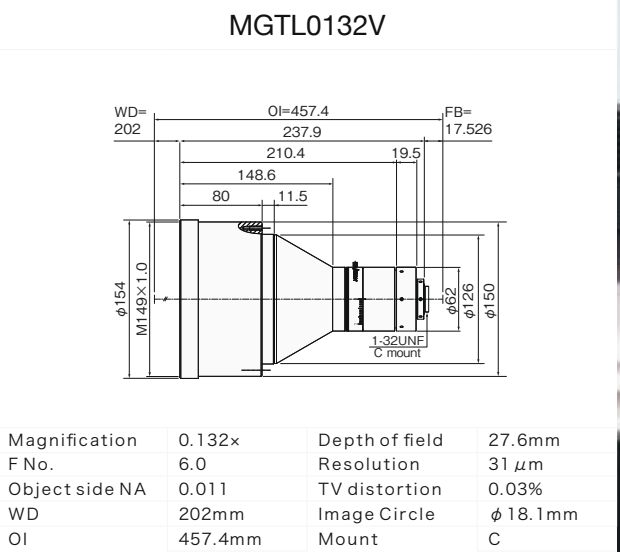
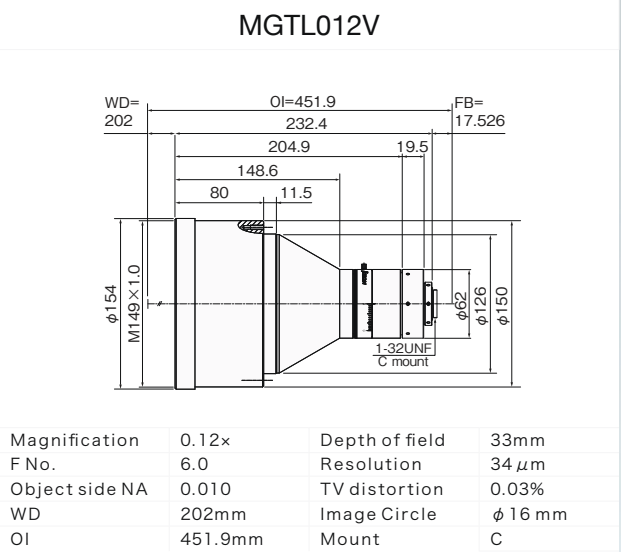
Flange adapter for large format low magnification telecentric lens



- Suitable for wide field of view telecentric lens
- Possible to hold heavy lens
- Improve safety in a vibrating environment such as equipment installation

Model	Lenses	
FG01L	MGTL0132V	MGTL012V
FG02L	MGTL0164V	MGTL015V
FG04L	MGTL022V	MGTL02V

Accessories: Screw 4 x 16 (8 pieces)



* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40μm.

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LARGE
FORMAT
φ28.2-30.8

Low Magnification Telecentric Lens for φ30mm

Suitable for F mount high resolution camera

- Reduces the focus difference due to wavelength
- LSTL078TW-F is suitable for visible – NIR
- Adjustable iris, possible to adjust depth of field



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Flange adapter for large format
low magnification telecentric lens

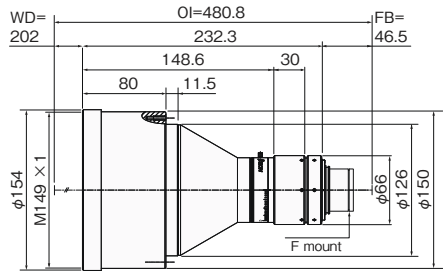


- Suitable for wide field of view telecentric lens
- Possible to hold heavy lens
- Improve safety in a vibrating environment such as equipment installation

Model	Lenses
FG01L	LSTL022T-F
FG02L	LSTL0275T-F
FG04L	LSTL0366T-F

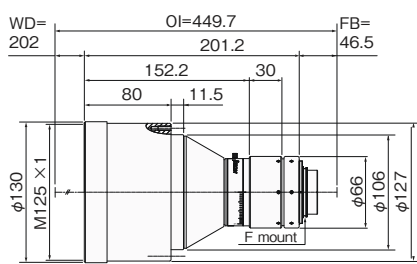
Accessories: Screw 4 x 16 (8 pieces)

LSTL022T-F



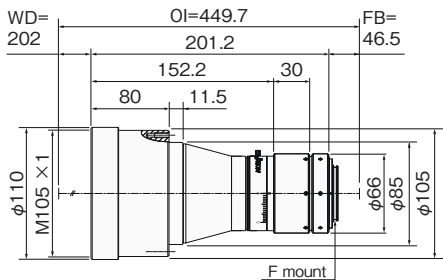
Magnification	0.22x	Depth of field	9.9mm
F No.	6.0	Resolution	18.3 μm
Object side NA	0.018	TV distortion	0.02%
WD	202mm	Image Circle	φ 29mm
OI	480.8mm	Mount	F/M42

LSTL0275T-F



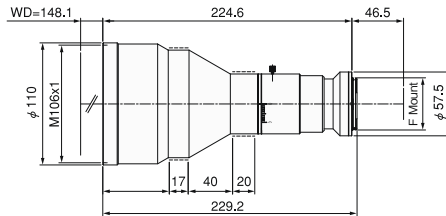
Magnification	0.275x	Depth of field	6.4mm
F No.	6.0	Resolution	14.7 μm
Object side NA	0.023	TV distortion	-0.01%
WD	202mm	Image Circle	φ 29 mm
OI	449.7mm	Mount	F/M42

LSTL0366T-F



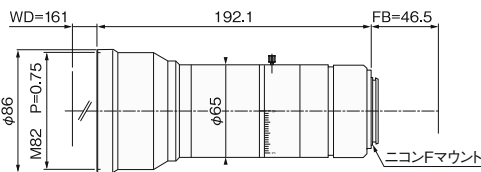
Magnification	0.366x	Depth of field	3.6mm
F No.	6.0	Resolution	11 μm
Object side NA	0.031	TV distortion	0.00%
WD	202mm	Image Circle	φ 29 mm
OI	449.6mm	Mount	F/M42

LSTL03TW-F



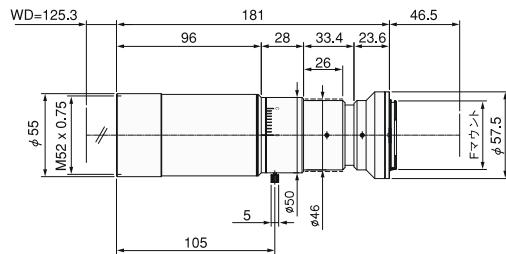
Magnification	0.3x	Depth of field	8.6mm
F No.	9.7	Resolution	22.4 μm
Object side NA	0.015	TV distortion	0.01%
WD	148.1mm	Image Circle	φ 28.2mm
OI	419.2mm	Mount	F

LSTL055TW-F



Magnification	0.55x	Depth of field	1.37mm
F No.	5.17	Resolution	6.33 μm
Object side NA	0.053	TV distortion	0.021%
WD	161.0mm	Image Circle	φ 30.8mm
OI	399.6mm	Mount	F

LSTL078TW-F



Magnification	0.78x	Depth of field	1.3mm
F No.	9.8	Resolution	8.4 μm
Object side NA	0.04	TV distortion	0.00%
WD	125.3mm	Image Circle	φ 28.2mm
OI	352.8mm	Mount	F

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.



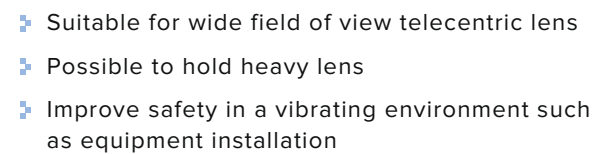
φ 44-48

Very high NA

- ▶ Line up : 0.35x, 0.5x, 1.0x, 1.5x and 2.0x
- ▶ Suitable for large area sensor of high resolution, 120 Mega Pixel, 71 Mega Pixel, and 50 Mega Pixel
- ▶ Design for large aperture
- ▶ Excellent uniformity of brightness and resolution
- ▶ Suitable for high speed and precise measurement
- ▶ Adjustable iris, possible to adjust depth of field



Flange adapter for large format low magnification telecentric lens



Model	Lenses
FG01L	LSTL035H-F
FG03L	LSTL05H-F
Accessories: Screw 4 x 16 (8 pieces)	

WD=202

Ol=503.9

FB=46.5

255.4

206.4

30

148.6

80

11.5

$\phi 154$

M149 × 1

$\phi 66$

$\phi 126$

$\phi 150$

F mount

Magnification	0.35×	Depth of field	3.9mm
F No.	6.0	Resolution	11.5 μ m
Object side NA	0.029	TV distortion	-0.01%
WD	202mm	Image Circle	ϕ 48mm
OI	503.9mm	Mount	F/M42

Technical drawing of the F-mount adapter showing dimensions in millimeters. The drawing includes a side view and a front view. Key dimensions include:

- WD=202
- OL=501.2
- FB=46.5
- 252.7
- 193.7
- 40
- 80
- 11.5
- $\phi 117$
- M112 $\times$ 1
- $\phi 66$
- $\phi 95$
- $\phi 115$
- F mount

Magnification	0.5x	Depth of field	1.9mm
F No.	6.0	Resolution	8.0 μ m
Object side NA	0.042	TV distortion	0.01%
WD	202mm	Image Circle	ϕ 48mm
OI	501.2mm	Mount	F/M42

Technical drawing of the F-mount assembly showing dimensions and components. The drawing includes the following dimensions and labels:

- Overall Length:** $OI = 343$
- Front Flange to Iris Ring:** $WD = 113.3$
- Iris Ring to F Mount:** 183.2
- Front Flange to F Mount:** $FB = 46.5$
- Front Flange:** $\phi 69$ and $M67 \times 0.75$
- Iris Ring:** Labeled "Iris Ring" with a callout arrow.
- Mount Body:** $\phi 52$
- F Mount:** Labeled "F mount" with a callout arrow.
- Mount Body to F Mount:** $\phi 57.5$

Magnification	1.0x	Depth of field	0.31mm
F No.	6.4	Resolution	4.3 μ m
Object side NA	0.077	TV distortion	0.01%
WD	113mm	Image Circle	ϕ 44mm
OI	343.0	Mount	F

Technical drawing of the optical system showing dimensions and components. The drawing includes the following dimensions and labels:

- Overall length: $OI = 359.5$
- Distance from front flange to iris ring: $WD = 109.1$
- Distance from iris ring to F mount: 203.9
- Distance from F mount to rear flange: $FB = 46.5$
- Front flange diameter: $\phi 57$
- Front flange thread: $M55 \times 0.75$
- Iris ring diameter: $\phi 52$
- Rear flange diameter: $\phi 61$
- Rear flange height: $\phi 57.5$
- Labels: "Iris Ring" and "F mount"

Magnification	1.5x	Depth of field	0.17mm
F No.	7.8	Resolution	3.5 μ m
Object side NA	0.095	TV distortion	0.02%
WD	109.1mm	Image Circle	ϕ 44mm
OI	359.5	Mount	F

Technical drawing of a shaft assembly. The drawing shows a shaft with a central section of diameter $\phi 52$ and two end sections of diameter $\phi 57$. The total length is $OI = 392.9$. The distance from the left end to the start of the central section is $WE = 109.2$. The distance from the start of the central section to the right end is 237.2 . The distance from the right end to the center of the shaft is $FB = 46.5$. The left end is labeled $M55 \times 0.75$. The right end is labeled F mount. A label $Ilis$ Ring points to a feature on the central section.

Magnification	2.0x	Depth of field	0.12mm
F No.	8.7	Resolution	2.9 μ m
Object side NA	0.12	TV distortion	-0.02%
WD	109mm	Image Circle	ϕ 44mm
OI	392.9	Mount	F

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm .

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25MP 1.1"

25 Mega Pixel Telecentric Lens for 1.1"

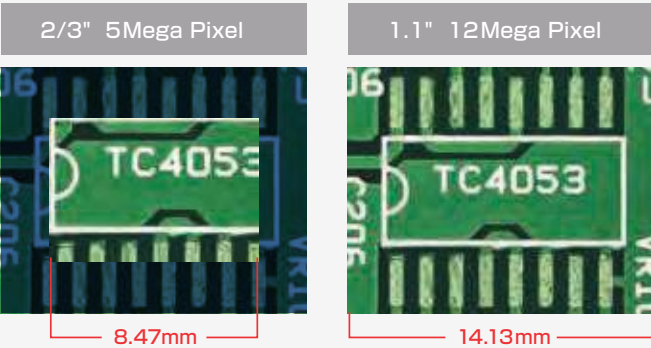
Possible to capture wide view with 1"-1.1" camera

- Suitable for 1.1", 25 Mega Pixel (2.5μm/Pixel) camera
- 0.5x-2.0x are adjustable iris, possible to adjust depth of field and contrast



View comparison image

Magnification : 1x
View comparison image between 1.1"12Mega Pixel camera and 2/3" 5 Mega Pixel camera
Possible to capture about 1.7x field of view



MLS22 □ Series LED Spotlight

Design for FTV series,
Telecentric Lens for 25 Mega Pixel

□= light color (R=RED, G=GREEN, B=BLUE, W=WHITE)



FTV05-110	
Magnification	0.5x
F No.	6.3
Object side NA	0.040
WD	114.7mm
OI	257.7mm
Depth of field	2.02mm
Resolution	8.5 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV07-110	
Magnification	0.7x
F No.	6.4
Object side NA	0.055
WD	115.0mm
OI	254.7mm
Depth of field	1.05mm
Resolution	6.1 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV08-110	
Magnification	0.8x
F No.	6.2
Object side NA	0.064
WD	115.0mm
OI	260.1mm
Depth of field	0.78mm
Resolution	5.2 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV10-110	
Magnification	1.0x
F No.	7.0
Object side NA	0.071
WD	110mm
OI	258.5mm
Depth of field	0.56mm
Resolution	4.7 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C
FTV15-110	
Magnification	1.5x
F No.	10.1
Object side NA	0.074
WD	110mm
OI	269.2mm
Depth of field	0.36mm
Resolution	4.5 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C
FTV20-110	
Magnification	2.0x
F No.	11.5
Object side NA	0.087
WD	110mm
OI	279.9mm
Depth of field	0.23mm
Resolution	3.9 μm
TV distortion	0.01%
Maximum Compatible sensor	1.1"
Mount	C
FTV30-110	
Magnification	3.0x
F No.	16.0
Object side NA	0.094
WD	110mm
OI	277.7mm
Depth of field	0.14mm
Resolution	3.6 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C
FTV40-110	
Magnification	4.0x
F No.	20.0
Object side NA	0.100
WD	110mm
OI	290.2mm
Depth of field	0.10mm
Resolution	3.4 μm
TV distortion	-0.01%
Maximum Compatible sensor	1.1"
Mount	C
FTV60-110	
Magnification	6.0x
F No.	30.0
Object side NA	0.100
WD	110mm
OI	300.0mm
Depth of field	0.07mm
Resolution	3.4 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.

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25MP1.1"

25 Mega Pixel Telecentric Lens for 1.1"

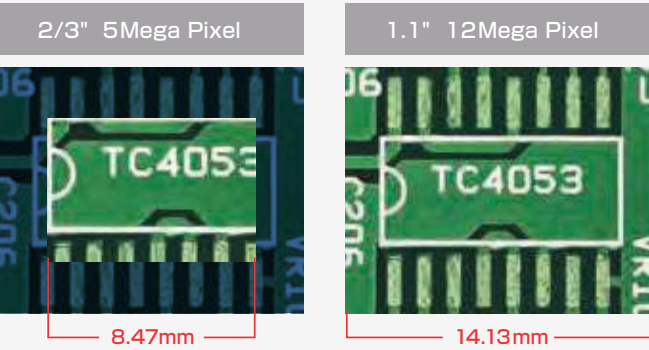
Possible to capture wide view with 1"-1.1" camera

- ▣ Suitable for 1.1", 25 Mega Pixel (2.5μm/Pixel) camera
- ▣ 0.5x-2.0x are adjustable iris, possible to adjust depth of field and contrast



View comparison image

Magnification : 1x
View comparison image between 1.1"12Mega Pixel camera and 2/3" 5 Mega Pixel camera
Possible to capture about 1.7x field of view



MLS22 □ Series LED Spotlight

Design for FTV series,
Telecentric Lens for 25 Mega Pixel

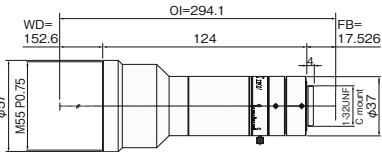
□ = light color (R=RED, G=GREEN, B=BLUE, W=WHITE)



FTV05C-110 <table><tr><td>Magnification</td><td>0.5x</td></tr><tr><td>F No.</td><td>6.3</td></tr><tr><td>Object side NA</td><td>0.040</td></tr><tr><td>WD</td><td>114.7mm</td></tr><tr><td>OI</td><td>257.7mm</td></tr><tr><td>Depth of field</td><td>2.02mm</td></tr><tr><td>Resolution</td><td>8.5 μm</td></tr><tr><td>TV distortion</td><td>0.00%</td></tr><tr><td>Maximum Compatible sensor</td><td>1.1"</td></tr><tr><td>Mount</td><td>C</td></tr></table>		Magnification	0.5x	F No.	6.3	Object side NA	0.040	WD	114.7mm	OI	257.7mm	Depth of field	2.02mm	Resolution	8.5 μm	TV distortion	0.00%	Maximum Compatible sensor	1.1"	Mount	C	FTV07C-110 <table><tr><td>Magnification</td><td>0.7x</td></tr><tr><td>F No.</td><td>6.4</td></tr><tr><td>Object side NA</td><td>0.055</td></tr><tr><td>WD</td><td>115.0mm</td></tr><tr><td>OI</td><td>254.7mm</td></tr><tr><td>Depth of field</td><td>1.05mm</td></tr><tr><td>Resolution</td><td>6.1 μm</td></tr><tr><td>TV distortion</td><td>0.00%</td></tr><tr><td>Maximum Compatible sensor</td><td>1.1"</td></tr><tr><td>Mount</td><td>C</td></tr></table>		Magnification	0.7x	F No.	6.4	Object side NA	0.055	WD	115.0mm	OI	254.7mm	Depth of field	1.05mm	Resolution	6.1 μm	TV distortion	0.00%	Maximum Compatible sensor	1.1"	Mount	C	FTV08C-110 <table><tr><td>Magnification</td><td>0.8x</td></tr><tr><td>F No.</td><td>6.2</td></tr><tr><td>Object side NA</td><td>0.064</td></tr><tr><td>WD</td><td>115.0mm</td></tr><tr><td>OI</td><td>260.1mm</td></tr><tr><td>Depth of field</td><td>0.78mm</td></tr><tr><td>Resolution</td><td>5.2 μm</td></tr><tr><td>TV distortion</td><td>0.00%</td></tr><tr><td>Maximum Compatible sensor</td><td>1.1"</td></tr><tr><td>Mount</td><td>C</td></tr></table>		Magnification	0.8x	F No.	6.2	Object side NA	0.064	WD	115.0mm	OI	260.1mm	Depth of field	0.78mm	Resolution	5.2 μm	TV distortion	0.00%	Maximum Compatible sensor	1.1"	Mount	C
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Object side NA	0.087																																																																
WD	110mm																																																																
OI	279.9mm																																																																
Depth of field	0.23mm																																																																
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FTV30C-110 <table><tr><td>Magnification</td><td>3.0x</td></tr><tr><td>F No.</td><td>16.0</td></tr><tr><td>Object side NA</td><td>0.094</td></tr><tr><td>WD</td><td>110mm</td></tr><tr><td>OI</td><td>277.7mm</td></tr><tr><td>Depth of field</td><td>0.14mm</td></tr><tr><td>Resolution</td><td>3.6 μm</td></tr><tr><td>TV distortion</td><td>0.00%</td></tr><tr><td>Maximum Compatible sensor</td><td>1.1"</td></tr><tr><td>Mount</td><td>C</td></tr></table>		Magnification	3.0x	F No.	16.0	Object side NA	0.094	WD	110mm	OI	277.7mm	Depth of field	0.14mm	Resolution	3.6 μm	TV distortion	0.00%	Maximum Compatible sensor	1.1"	Mount	C	FTV40C-110 <table><tr><td>Magnification</td><td>4.0x</td></tr><tr><td>F No.</td><td>20.0</td></tr><tr><td>Object side NA</td><td>0.100</td></tr><tr><td>WD</td><td>110mm</td></tr><tr><td>OI</td><td>290.2mm</td></tr><tr><td>Depth of field</td><td>0.10mm</td></tr><tr><td>Resolution</td><td>3.4 μm</td></tr><tr><td>TV distortion</td><td>-0.01%</td></tr><tr><td>Maximum Compatible sensor</td><td>1.1"</td></tr><tr><td>Mount</td><td>C</td></tr></table>		Magnification	4.0x	F No.	20.0	Object side NA	0.100	WD	110mm	OI	290.2mm	Depth of field	0.10mm	Resolution	3.4 μm	TV distortion	-0.01%	Maximum Compatible sensor	1.1"	Mount	C	FTV60C-110 <table><tr><td>Magnification</td><td>6.0x</td></tr><tr><td>F No.</td><td>30.0</td></tr><tr><td>Object side NA</td><td>0.100</td></tr><tr><td>WD</td><td>110mm</td></tr><tr><td>OI</td><td>300.0mm</td></tr><tr><td>Depth of field</td><td>0.07mm</td></tr><tr><td>Resolution</td><td>3.4 μm</td></tr><tr><td>TV distortion</td><td>0.00%</td></tr><tr><td>Maximum Compatible sensor</td><td>1.1"</td></tr><tr><td>Mount</td><td>C</td></tr></table>		Magnification	6.0x	F No.	30.0	Object side NA	0.100	WD	110mm	OI	300.0mm	Depth of field	0.07mm	Resolution	3.4 μm	TV distortion	0.00%	Maximum Compatible sensor	1.1"	Mount	C
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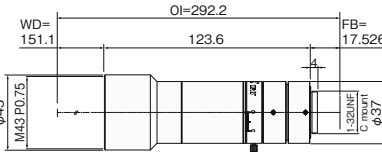
* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40μm.

FTV05-150



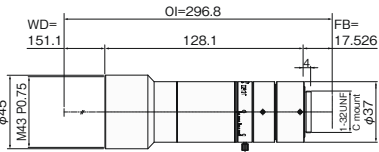
Magnification	0.5×
F No.	6.3
Object side NA	0.040
WD	152.6mm
OI	294.1mm
Depth of field	2mm
Resolution	8.4 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV07-150



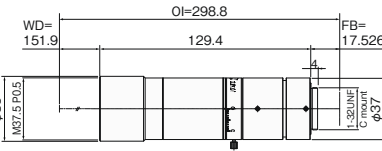
Magnification	0.7×
F No.	9.0
Object side NA	0.039
WD	151.1mm
OI	292.2mm
Depth of field	1.47mm
Resolution	8.6 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV08-150



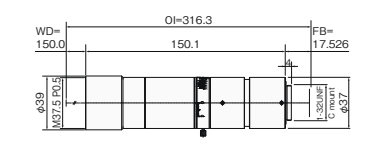
Magnification	0.8×
F No.	8.1
Object side NA	0.050
WD	151.1mm
OI	296.8mm
Depth of field	1.01mm
Resolution	6.8 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV10-150



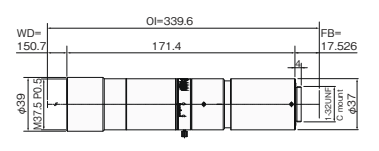
Magnification	1.0×
F No.	9.1
Object side NA	0.055
WD	151.9mm
OI	298.8mm
Depth of field	0.73mm
Resolution	6.1 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV15-150



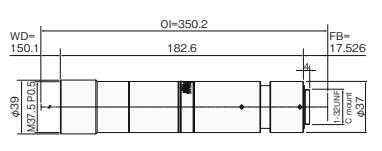
Magnification	1.5×
F No.	11.8
Object side NA	0.064
WD	150.7mm
OI	316.3mm
Depth of field	0.42mm
Resolution	5.3 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV20-150



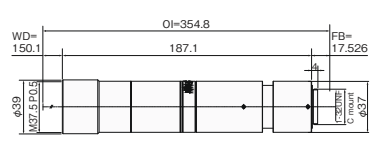
Magnification	2.0×
F No.	13.5
Object side NA	0.074
WD	150.7mm
OI	339.6mm
Depth of field	0.27mm
Resolution	4.5 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV30-150



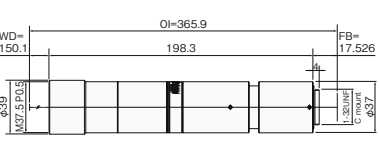
Magnification	3.0×
F No.	17.4
Object side NA	0.086
WD	150.1mm
OI	350.2mm
Depth of field	0.16mm
Resolution	3.9 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV40-150



Magnification	4.0×
F No.	22.0
Object side NA	0.091
WD	150.1mm
OI	354.8mm
Depth of field	0.11mm
Resolution	3.7 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

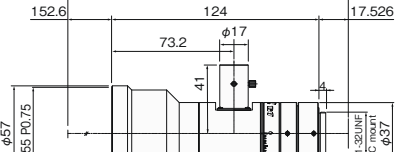
FTV60-150



Magnification	6.0×
F No.	33.0
Object side NA	0.091
WD	150.1mm
OI	365.9mm
Depth of field	0.07mm
Resolution	3.7 μm
TV distortion	0.01%
Maximum Compatible sensor	1.1"
Mount	C

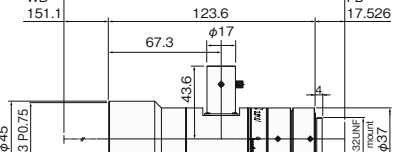
* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.

FTV05C-150



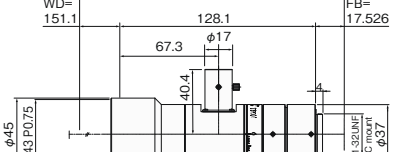
Magnification	0.5×
F No.	6.3
Object side NA	0.040
WD	152.6mm
OI	294.1mm
Depth of field	2mm
Resolution	8.4 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV07C-150



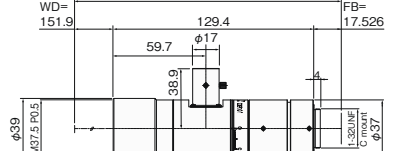
Magnification	0.7×
F No.	9.0
Object side NA	0.039
WD	151.1mm
OI	292.2mm
Depth of field	1.47mm
Resolution	8.6 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV08C-150



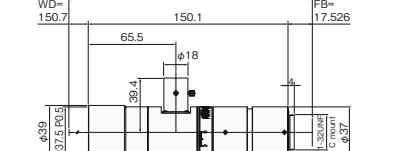
Magnification	0.8×
F No.	8.1
Object side NA	0.050
WD	151.1mm
OI	296.8mm
Depth of field	1.01mm
Resolution	6.8 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV10C-150



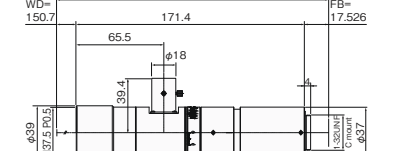
Magnification	1.0×
F No.	9.1
Object side NA	0.055
WD	151.9mm
OI	298.8mm
Depth of field	0.73mm
Resolution	6.1 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV15C-150



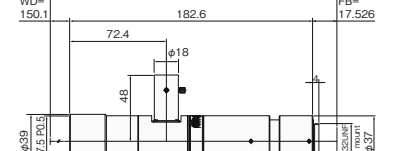
Magnification	1.5×
F No.	11.8
Object side NA	0.064
WD	150.7mm
OI	316.3mm
Depth of field	0.42mm
Resolution	5.3 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV20C-150



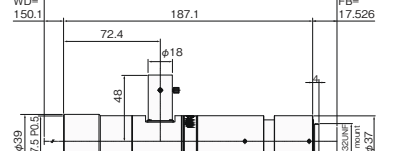
Magnification	2.0×
F No.	13.5
Object side NA	0.074
WD	150.7mm
OI	339.6mm
Depth of field	0.27mm
Resolution	4.5 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV30C-150



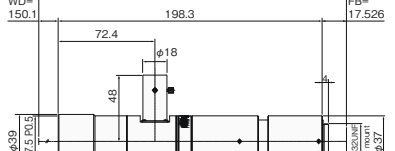
Magnification	3.0×
F No.	17.4
Object side NA	0.086
WD	150.1mm
OI	350.2mm
Depth of field	0.16mm
Resolution	3.9 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV40C-150



Magnification	4.0×
F No.	22.0
Object side NA	0.091
WD	150.1mm
OI	354.8mm
Depth of field	0.11mm
Resolution	3.7 μm
TV distortion	0.00%
Maximum Compatible sensor	1.1"
Mount	C

FTV60C-150



Magnification	6.0×
F No.	33.0
Object side NA	0.091
WD	150.1mm
OI	365.9mm
Depth of field	0.07mm
Resolution	3.7 μm
TV distortion	0.01%
Maximum Compatible sensor	1.1"
Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.

□□□□□□□□

SWIR

1.1"

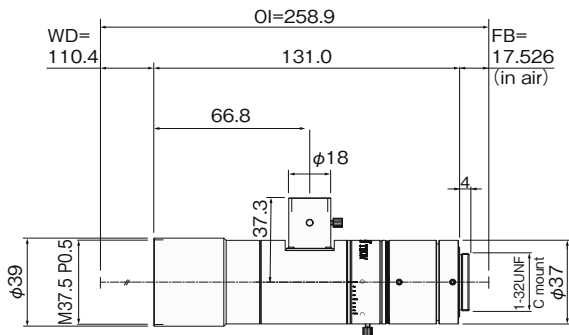
SWIR Telecentric Lens for 1.1"

Possible to capture differences and defects that cannot be seen in visible ray

- Available for SWIR image sensor 1", InGaAs Sensor
- Special design to transmit SWIR 900nm-1700nm
- Possible to capture differences and defects that cannot be seen in visible ray
- 1.0x/2.0x lenses are adjustable iris, possible to adjust depth of field

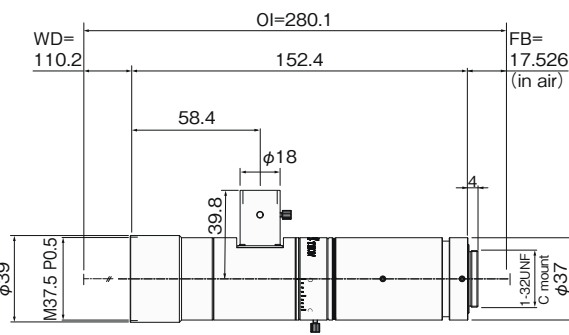


FTV10C-110SW



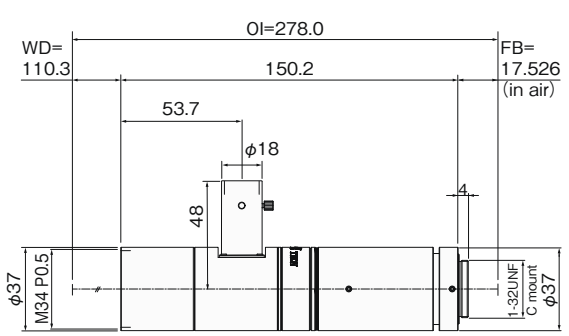
Magnification	1.0x	Depth of field	0.56mm
F No.	7.0	Resolution	10.3 μm
Object side NA	0.071	TV distortion	0.02%
WD	110.4mm	Maximum Compatible sensor	1.1"
OI	258.9mm	Mount	C

FTV20C-110SW



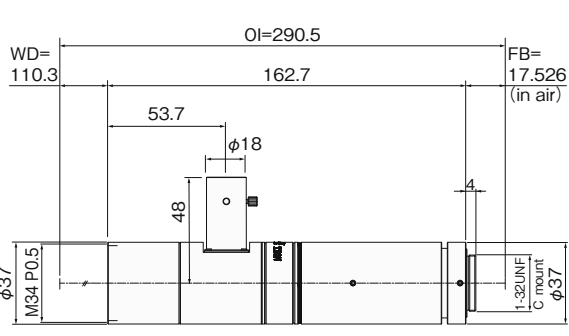
Magnification	2.0x	Depth of field	0.23mm
F No.	11.5	Resolution	8.4 μm
Object side NA	0.087	TV distortion	0.03%
WD	110.2mm	Maximum Compatible sensor	1.1"
OI	280.1mm	Mount	C

FTV30C-110SW



Magnification	3.0x	Depth of field	0.14mm
F No.	16.0	Resolution	7.8 μm
Object side NA	0.094	TV distortion	0.02%
WD	110.3mm	Maximum Compatible sensor	1.1"
OI	278.0mm	Mount	C

FTV40C-110SW



Magnification	4.0x	Depth of field	0.10mm
F No.	20.0	Resolution	7.3 μm
Object side NA	0.100	TV distortion	0.02%
WD	110.3mm	Maximum Compatible sensor	1.1"
OI	290.5mm	Mount	C

NEW



SWIR 150W Halogen Light Source

Model	MYHA-150VR
Wavelength	400~1700nm
Input Voltage	AC100V~240V
Light guide	Heat resisting temperature
Option	Output Control

Features

- Wave length: 400nm~1700nm (Peak Wave length: 1000nm)
- Irradiation in the NIR is supported by 150W halogen lamp
- Filter attachment / detachment mechanism
- Possible to select wavelength by bandpass filter
- Light guide for Spot / Ring / Line are available

The detail information is written Page 104 - 105

NEW



LED Spotlight

Model	Wavelength
MSL22-1050SWH	1050nm
MSL22-1100SW	1100nm
MSL22-1550SW	1550nm

*Possible to design 1200nm, 1450nm

Features

- Design for FTV-SW series
- 1050nm, 1100nm, and 1550nm are available
- Irradiate wide range object with high brightness and high uniformity

1.1"

Vari Focal Telecentric Lens at 0.7x - 1.4x
Possible to change magnification range by using front converter

-
- A black Nikon 11 TRON 57137W 0.7-14x telescope with a zoom eyepiece, shown next to its objective lens cap. The telescope has a zoom eyepiece with a scale from 0.7 to 14x magnification. The Nikon logo and model number are visible on the body.

[illegible][illegible]

* Indicated specifications are design values. * Resolution is calculated based on MTF
* Depth of field is calculated assuming permissible circle of confusion is 40 μm .

2/3"

Vari Focal Telecentric Lens at 0.5x - 1.3x
Possible to change magnification range by using front converter

-
- Figure 1: Comparison of microscope objectives. The image shows three objectives: a 1.3x objective on the left, a 0.5x objective in the middle, and a 0.5x objective on the right. The 1.3x objective is shown with a yellow circular field of view. The 0.5x objective is shown with a yellow circular field of view. The 0.5x objective is shown with a yellow circular field of view.

Technical drawing of the 1000 Series Motor showing dimensions in inches and millimeters. The drawing includes the following dimensions:

- Overall length: 129.6 (x1.3)
- Distance from mounting face to center of shaft: 111 (x1.0)
- Distance from mounting face to center of terminal box: 80 (x0.5)
- Distance from mounting face to center of cooling fan: 17.526
- Shaft diameter: $\phi 32$
- Terminal box dimensions: M30.5 P 0.5
- Mounting face dimensions: WD=97.2 (x1.3), WD=115.1 (x1.0), WD=173 (0.5x)
- Mounting face to center of terminal box: L25.4
- Mounting face to center of cooling fan: P=1.32" C Mount

Technical drawing of the P1125.4 motor assembly showing dimensions in mm and inches:

- Overall length: 141.6 (x1,0)
- Motor body length: 107.5 (x0,47)
- Motor body diameter: 92 (x0,25)
- Motor body height: 17.526
- Motor body width: 4
- Motor body height (mounting): 125.4
- Motor body width (mounting): P=1/32" C Mount
- Motor body diameter (mounting): $\phi 44.5$
- Motor body diameter (mounting): $\phi 46$
- Motor body diameter (mounting): $\phi 32$
- Motor body diameter (mounting): M30.5 P=0.5
- Motor body diameter (mounting): WD=115.6 (x1,0)
- Motor body diameter (mounting): WD=190.9 (x0,47)
- Motor body diameter (mounting): WD=323.2 (x0,25)

[illegible]

* Indicated specifications are design values. * Resolution is calculated based on MTF
* Depth of field is calculated assuming permissible circle of confusion is $40\mu\text{m}$.

□ □ □ □ □ □ □ □ □ □

12-25MP

1.1”

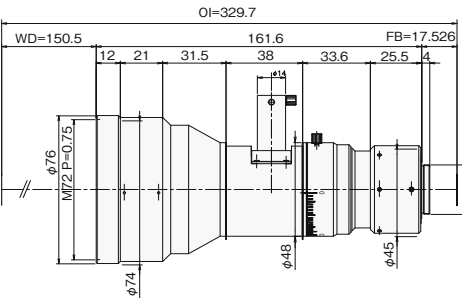
12-25 Mega Pixel Telecentric Lens for 1.1”

Wide field of view 0.3x and 0.345x

- ❖ MGTL03V and MGTL03VC are suitable for 12 Mega Pixel
- ❖ MGTL0345V is suitable for 25 Mega Pixel
- ❖ Long working distance, 150mm - 160mm with excellent brightness
- ❖ Variable iris, possible to adjust DOF
- ❖ Suitable for measurement and inspection, required for high accuracy

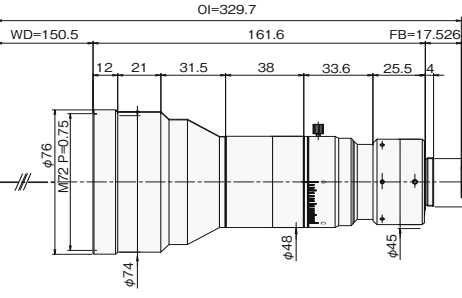


MGTL03VC



Magnification	0.3×	Depth of field	4.26mm
F No.	4.8	Resolution	10.8 μ
Object side NA	0.031	TV distortion	0.00%
WD	150.5mm	Maximum Compatible sensor	1.1
OI	329.7mm	Mount	C

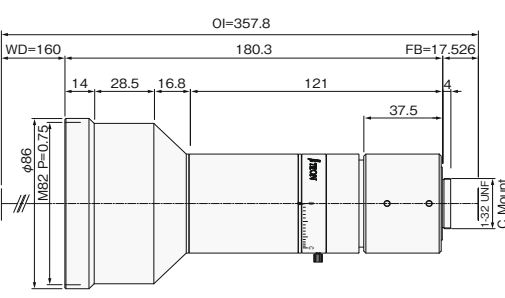
MGTL03V



Magnification	0.3×	Depth of field	4.26mm
F No.	4.8	Resolution	10.8 μ
Object side NA	0.031	TV distortion	0.00%
WD	150.5mm	Maximum Compatible sensor	1.1
OI	329.7mm	Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.

MGTL0345V



Magnification	0.345×	Depth of field	3.2mm
F No.	4.8	Resolution	9.3 μ
Object side NA	0.036	TV distortion	0.00%
WD	160mm	Maximum Compatible sensor	1.1
OI	357.8mm	Mount	C

□ □ □ □ □ □ □ □ □ □

4-9MP

1”

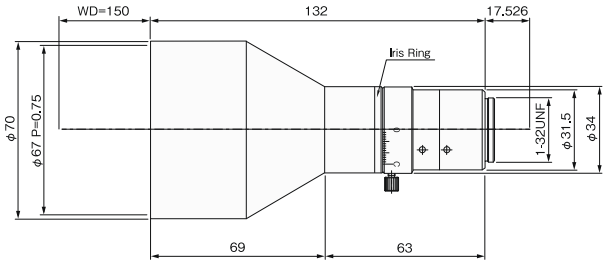
4-9 Mega Pixel Telecentric lens for 1”

Design for 1” High resolution and suitable for large field of view

- ❖ 4 Mega Pixel – 9 Mega Pixel telecentric lens series for 1”
- ❖ 0.275x and 0.37x are available
- ❖ MGTL0275V is designed for long working distance, 150mm
- ❖ Excellent relative illumination
- ❖ Adjustable iris, possible to adjust depth of field



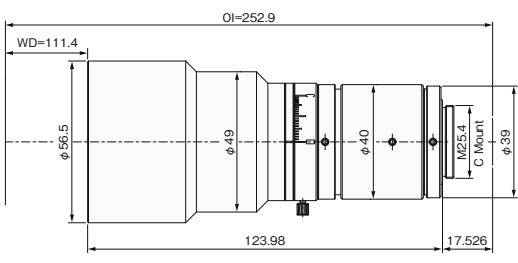
MGTL0275V



Magnification	0.275×	Depth of field	7.2mm
F No.	6.8	Resolution	16.8 μ
Object side NA	0.02	TV distortion	0.01%
WD	150mm	Maximum Compatible sensor	1
OI	299.5mm	Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.

MGTL037V



Magnification	0.37×	Depth of field	3.8mm
F No.	6.5	Resolution	12 μ
Object side NA	0.028	TV distortion	0.01%
WD	111mm	Maximum Compatible sensor	1
OI	252.9mm	Mount	C

□ □ □ □ □ □ □ □ □ □

5MP 2/3"

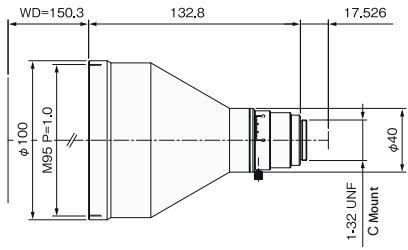
Low Magnification Telecentric Lens for 5 Mega Pixel

Possible to capture wide field of view with high resolution

- ▣ Suitable for 3.45μm
- ▣ Line up : 0.14x, 0.17x, 0.19x and 0.22x
- ▣ Long working distance, WD150mm
- ▣ WD180mm type is available for 0.14x
- ▣ Compact design with low magnification
- ▣ Adjustable iris, possible to adjust depth of field

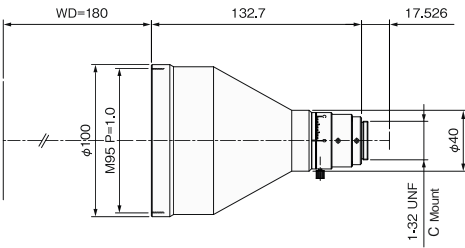


MGTL014VM



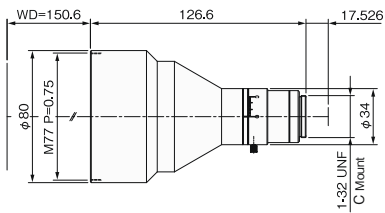
Magnification	0.14x	Depth of field	17.5mm
F No.	4.3	Resolution	20.5 μm
Object side NA	0.016	TV distortion	0.01%
WD	150.3mm	Maximum Compatible sensor	2/3"
OI	300.6mm	Mount	C

MGTL014VM-180



Magnification	0.14x	Depth of field	18mm
F No.	4.4	Resolution	21 μm
Object side NA	0.016	TV distortion	-0.01%
WD	180mm	Maximum Compatible sensor	2/3"
OI	330.2mm	Mount	C

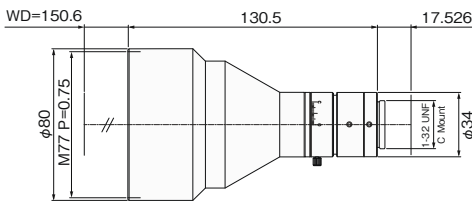
MGTL017VM



Magnification	0.17x	Depth of field	14.4mm
F No.	5.2	Resolution	20.5 μm
Object side NA	0.016	TV distortion	0.00%
WD	150.6mm	Maximum Compatible sensor	2/3"
OI	294.7mm	Mount	C

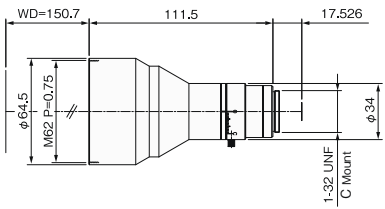
NEW

MGTL019VM



Magnification	0.19x	Depth of field	12.6mm
F No.	5.7	Resolution	20.1 μm
Object side NA	0.017	TV distortion	0.00%
WD	150.6mm	Maximum Compatible sensor	2/3"
OI	298.6mm	Mount	C

MGTL022VM



Magnification	0.22x	Depth of field	8.5mm
F No.	5.2	Resolution	15.8 μm
Object side NA	0.021	TV distortion	0.00%
WD	150.7mm	Maximum Compatible sensor	2/3"
OI	279.7mm	Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40μm.



Suitable for the inspection in ultra high accuracy

- Suitable for 3.45μm
- Excellent brightness, compared to Mega Pixel telecentric lenses
- Adjustable iris, possible to adjust depth of field
- Compact design
- Reduce hot spots of co-axial illumination
- MGTL10V and MGTL10VC are suitable for 1.1"



Magnification	0.23x
F No.	5.2
Object side NA	0.022
WD	109mm
OI	241mm
Depth of field	7.9mm
Resolution	8.7 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

[illegible]

Magnification	0.3x
F No.	5.0
Object side NA	0.03
WD	111mm
OI	263mm
Depth of field	4.4mm
Resolution	6.6 μ m
TV distortion	-0.04%
Maximum Compatible sensor	2/3"
Mount	C

Technical drawing of a 1000W laser tube. The drawing shows a cylindrical component with various diameters and lengths. The dimensions are as follows:

- Overall length: 139.5
- Distance from the left end to the start of the last thread: 17.526
- Left end diameter: $\phi 51$
- Thread specification at the left end: M49 P=0.75
- Distance from the left end to the start of the second thread: WD=110.7
- Second thread diameter: $\phi 45$
- Third thread diameter: $\phi 31.5$
- Fourth thread diameter: $\phi 25.4$
- Thread specification at the right end: UN2.5
- Right end diameter: $\phi 12.7$

Magnification	0.345x
F No.	4.9
Object side NA	0.035
WD	111mm
OI	267mm
Depth of field	3.3mm
Resolution	5.5 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

Technical drawing of a mechanical assembly showing dimensions in millimeters. The drawing includes a side view and a cross-sectional view. Key dimensions include: outer diameter 45 mm, thread M43 P=0.75, inner diameter 39 mm, length 148.2 mm, inner diameter 31.5 mm, length 17.526 mm, and a cross-section showing a hole with diameter 25.4 mm and a mounting point. A note indicates WD=109.4 mm.

Magnification	0.4x
F No.	5.0
Object side NA	0.04
WD	109mm
OI	275mm
Depth of field	2.5mm
Resolution	4.9 μ m
TV distortion	0.00%
Maximum Compatible sensor	2/3"
Mount	C

Technical drawing of the front view of a mechanical part. The drawing shows a cylindrical component with a central hole. The dimensions and tolerances are as follows:

- Overall length: 143.9
- Distance from the left face to the center of the hole: 95.2
- Distance from the right face to the center of the hole: 17.526
- Left face diameter: $\phi 51$
- Left face tolerance: $M49 P-0.75$
- Inner hole diameter: $\phi 45$
- Inner hole tolerance: $\phi 31.5$
- Right face diameter: $\phi 32$
- Right face tolerance: C Mount
- Working distance (WD): 110.7

Magnification	0.345x
F No.	4.9
Object side NA	0.035
WD	111mm
OI	272mm
Depth of field	3.3mm
Resolution	5.5 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

Technical drawing of the front view of a mechanical part. The drawing shows a stepped cylindrical profile with the following dimensions (in mm):

- Outer diameter: $\phi 44.5$
- Inner diameter: $\phi 39$
- Central hole diameter: $\phi 31.5$
- Length of the first section: 96.5
- Length of the second section: 152.6
- Length of the third section: 17.526
- Detail view dimensions: 6.32 and 1.62
- Note: WD = 109.4

Magnification	0.4x
F No.	5.0
Object side NA	0.04
WD	109mm
OI	280mm
Depth of field	2.5mm
Resolution	4.9 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

[illegible]

Magnification	0.5x
F No.	4.7
Object side NA	0.05
WD	109mm
OI	293mm
Depth of field	1.5mm
Resolution	3.8μ
TV distortion	-0.03%
Maximum Compatible sensor	2/3
Mount	C

Technical drawing of the C-mount adapter showing dimensions in millimeters. The drawing includes a side view with dimensions: total length 185, mounting hole diameter 12.7, and a 17.526 segment. A detail view shows a 12.7 hole in a 35.4 diameter section. A cross-section shows a 38 hole, 0.5 wall thickness, and 109.16 length. A note specifies M35.5 P=0.5 Filter Pinfit.

Magnification	0.69x
F No.	6.6
Object side NA	0.052
WD	109mm
OI	312mm
Depth of field	1.1mm
Resolution	3.9 μ
TV distortion	-0.04%
Maximum Compatible sensor	2/3
Mount	C

Magnification	1.0x
F No.	5.4
Object side NA	0.093
WD	71mm
OI	196mm
Depth of field	0.43mm
Resolution	2.5 μ
TV distortion	0.00%
Maximum Compatible sensor	1.1
Mount	C

Magnification	1.0x
F No.	5.4
Object side NA	0.093
WD	71mm
OI	200mm
Depth of field	0.43mm
Resolution	2.5 μ
TV distortion	0.00%
Maximum Compatible sensor	1.1
Mount	C

* Indicated specifications are design values. * Resolution is calculated based on MTF
* Depth of field is calculated assuming permissible circle of confusion is $40\mu\text{m}$.

□ □ □ □ □ □ □ □

2MP

1/2" - 2/3"

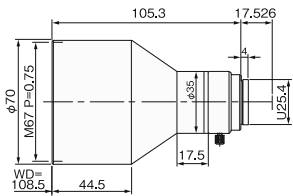
2 Mega Pixel Telecentric Lens

High resolution, compatible with 2 Mega Pixel camera

- ❖ Compact design, suitable for small device
- ❖ Adjustable iris, possible to adjust depth of field
- ❖ TV distortion less than 0.05%
- ❖ MGTLO5-1.1 is suitable for 1.1"
- ❖ MGTLO275V-2 is suitable for 2/3"(φ12.8mm)

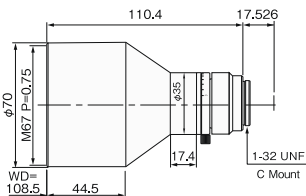


MGTLO14



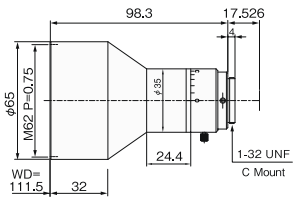
Magnification	0.14x	Depth of field	16.3mm
F No.	4.0	Resolution	19.7 μ
Object side NA	0.017	TV distortion	0.02%
WD	108mm	Maximum Compatible sensor	1/2
OI	231mm	Mount	C

MGTLO19



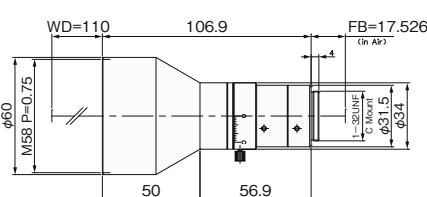
Magnification	0.19x	Depth of field	8.9mm
F No.	4.0	Resolution	14.0 μ
Object side NA	0.024	TV distortion	0.01%
WD	108mm	Maximum Compatible sensor	2/3
OI	236mm	Mount	C

MGTLO23



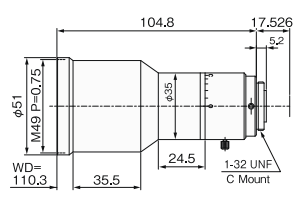
Magnification	0.23x	Depth of field	8.3mm
F No.	5.5	Resolution	16.0 μ
Object side NA	0.021	TV distortion	0.01%
WD	111mm	Maximum Compatible sensor	2/3
OI	227mm	Mount	C

MGTLO275-2



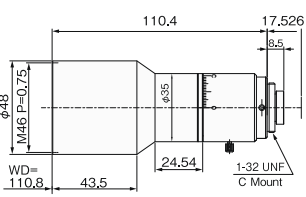
Magnification	0.275x	Depth of field	8.1mm
F No.	7.6	Resolution	18.6 μ
Object side NA	0.018	TV distortion	0.00%
WD	110mm	Maximum Compatible sensor	2/3
OI	234mm	Mount	C

MGTLO3



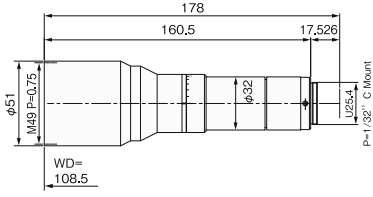
Magnification	0.3x	Depth of field	6.2mm
F No.	7.0	Resolution	16.0 μ
Object side NA	0.021	TV distortion	0.05%
WD	110mm	Maximum Compatible sensor	2/3
OI	233mm	Mount	C

MGTLO4



Magnification	0.4x	Depth of field	4.6mm
F No.	9.2	Resolution	15.2 μ
Object side NA	0.022	TV distortion	0.00%
WD	110mm	Maximum Compatible sensor	2/3
OI	239mm	Mount	C

MGTLO5-1.1



Magnification	0.5x	Depth of field	2mm
F No.	6.37	Resolution	8.6 μ
Object side NA	0.039	TV distortion	0.00%
WD	108mm	Maximum Compatible sensor	1.1
OI	286mm	Mount	C

* Indicated specifications are design values. * Depth of field is calculated assuming permissible circle of confusion is 40μm.

□□□□□□

2-5MP

2/3"

WD65 High NA Mega Pixel Telecentric Lens

Design for 2-5 Mega Pixel Compact and high durability

- ❖ Mega Pixel telecentric lens for 2/3"
- ❖ Suitable for 2 Mega Pixel - 5 Mega Pixel
- ❖ High contrast with co-axial illumination
- ❖ TV distortion less than 0.01%
- ❖ R type is improved contrast and relative illumination

MLS14 □ Series

Compact size Coaxial spotlight

Design for FT series,
Telecentric Lens for 2-5
Mega Pixel

□= light color(R=RED, G=GREEN,
B=BLUE, W=WHITE)



FT20-65R	FT30-65R	FT40-65R	FT60-65R
Magnification 2.0x F No. 12.5 Object side NA 0.08 WD 65.5mm OI 161.8mm Depth of field 0.25mm Resolution 4.2 μ TV distortion 0.00% Maximum Compatible sensor 2/3 Mount C	Magnification 3.0x F No. 12.5 Object side NA 0.12 WD 65mm OI 186.2mm Depth of field 0.11mm Resolution 2.8 μ TV distortion -0.01% Maximum Compatible sensor 2/3 Mount C	Magnification 4.0x F No. 16 Object side NA 0.125 WD 65mm OI 192mm Depth of field 0.08mm Resolution 2.7 μ TV distortion -0.01% Maximum Compatible sensor 2/3 Mount C	Magnification 6.0x F No. 24 Object side NA 0.125 WD 65mm OI 207.7mm Depth of field 0.05mm Resolution 2.7 μ TV distortion 0.00% Maximum Compatible sensor 2/3 Mount C

FT05C-65R	FT08C-65R	FT10C-65R	FT15C-65R
Magnification 0.5x F No. 9.1 Object side NA 0.028 WD 65.5mm OI 169.6mm Depth of field 2.91mm Resolution 12.2 μ TV distortion 0.00% Maximum Compatible sensor 2/3 Mount C	Magnification 0.8x F No. 9.5 Object side NA 0.042 WD 65.8mm OI 150.3mm Depth of field 1.19mm Resolution 8.0 μ TV distortion 0.00% Maximum Compatible sensor 2/3 Mount C	Magnification 1.0x F No. 9.7 Object side NA 0.052 WD 65.8mm OI 157.7mm Depth of field 0.78mm Resolution 6.5 μ TV distortion 0.00% Maximum Compatible sensor 2/3 Mount C	Magnification 1.5x F No. 10.6 Object side NA 0.071 WD 65.5mm OI 156.9mm Depth of field 0.38mm Resolution 4.7 μ TV distortion 0.00% Maximum Compatible sensor 2/3 Mount C

FT20C-65R	FT30C-65R	FT40C-65R	FT60C-65R
Magnification 2.0x F No. 12.5 Object side NA 0.08 WD 65.5mm OI 161.8mm Depth of field 0.25mm Resolution 4.2 μ TV distortion 0.00% Maximum Compatible sensor 2/3 Mount C	Magnification 3.0x F No. 12.5 Object side NA 0.12 WD 65mm OI 186.2mm Depth of field 0.11mm Resolution 2.8 μ TV distortion -0.01% Maximum Compatible sensor 2/3 Mount C	Magnification 4.0x F No. 16 Object side NA 0.125 WD 65mm OI 192mm Depth of field 0.08mm Resolution 2.7 μ TV distortion -0.01% Maximum Compatible sensor 2/3 Mount C	Magnification 6.0x F No. 24 Object side NA 0.125 WD 65mm OI 207.7mm Depth of field 0.05mm Resolution 2.7 μ TV distortion 0.00% Maximum Compatible sensor 2/3 Mount C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40μm.

□□□□□□

2-5MP

2/3"

WD110 High NA Mega Pixel Telecentric Lens

Design for 2-5 Mega Pixel Compact and high durability

- ❖ Mega Pixel telecentric lens for 2/3"
- ❖ Suitable for 2 Mega Pixel - 5 Mega Pixel
- ❖ High contrast with co-axial illumination
- ❖ TV distortion less than 0.01%

MLS14 □ Series

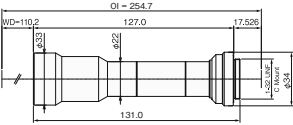
Compact size Coaxial spotlight

Design for FT series,
Telecentric Lens for 2-5
Mega Pixel

□= light color(R=RED, G=GREEN,
B=BLUE, W=WHITE)

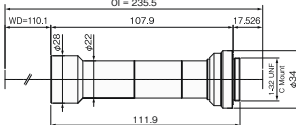


FT05-110



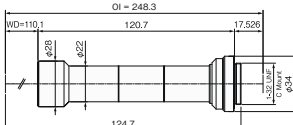
Magnification	0.5×
F No.	9.6
Object side NA	0.026
WD	110mm
OI	254.7mm
Depth of field	3.1mm
Resolution	12.9 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT08-110



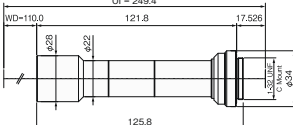
Magnification	0.8×
F No.	11.1
Object side NA	0.036
WD	110mm
OI	235.5mm
Depth of field	1.4mm
Resolution	9.3 μ
TV distortion	0.01%
Maximum Compatible sensor	2/3
Mount	C

FT10-110



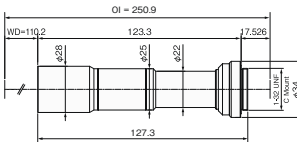
Magnification	1.0×
F No.	11.1
Object side NA	0.045
WD	110mm
OI	248.3mm
Depth of field	0.9mm
Resolution	7.5 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT15-110



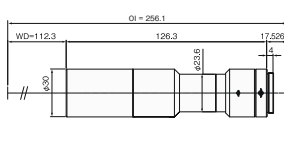
Magnification	1.5×
F No.	11.9
Object side NA	0.063
WD	110mm
OI	249.4mm
Depth of field	0.4mm
Resolution	5.3 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT20-110



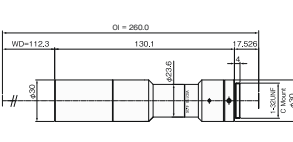
Magnification	2.0×
F No.	13.5
Object side NA	0.074
WD	110mm
OI	250.9mm
Depth of field	0.3mm
Resolution	4.5 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT30-110R



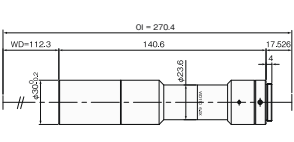
Magnification	3.0×
F No.	17.2
Object side NA	0.087
WD	112mm
OI	256.1mm
Depth of field	0.15mm
Resolution	3.9 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT40-110R



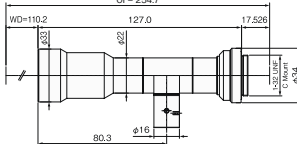
Magnification	4.0×
F No.	22.0
Object side NA	0.091
WD	112mm
OI	260.0mm
Depth of field	0.11mm
Resolution	3.7 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT60-110R



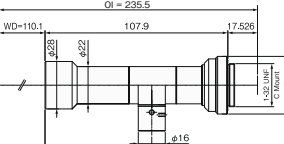
Magnification	6.0×
F No.	33.0
Object side NA	0.091
WD	112mm
OI	270.4mm
Depth of field	0.07mm
Resolution	3.7 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT05C-110



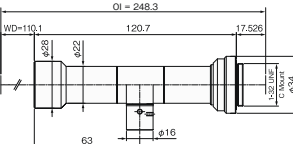
Magnification	0.5×
F No.	9.6
Object side NA	0.026
WD	110mm
OI	254.7mm
Depth of field	3.1mm
Resolution	12.9 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT08C-110



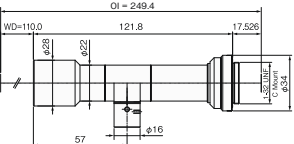
Magnification	0.8×
F No.	11.1
Object side NA	0.036
WD	110mm
OI	235.5mm
Depth of field	1.4mm
Resolution	9.3 μ
TV distortion	0.01%
Maximum Compatible sensor	2/3
Mount	C

FT10C-110



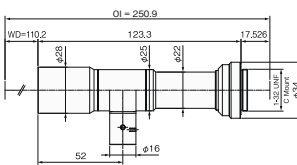
Magnification	1.0×
F No.	11.1
Object side NA	0.045
WD	110mm
OI	248.3mm
Depth of field	0.9mm
Resolution	7.5 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT15C-110



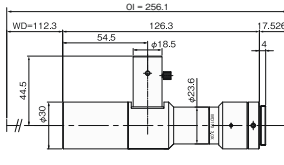
Magnification	1.5×
F No.	11.9
Object side NA	0.063
WD	110mm
OI	249.4mm
Depth of field	0.4mm
Resolution	5.3 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT20C-110



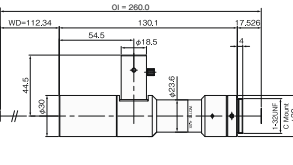
Magnification	2.0×
F No.	13.5
Object side NA	0.074
WD	110mm
OI	250.9mm
Depth of field	0.3mm
Resolution	4.5 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT30C-110R



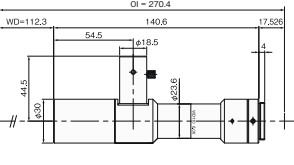
Magnification	3.0×
F No.	17.2
Object side NA	0.087
WD	112mm
OI	256.1mm
Depth of field	0.15mm
Resolution	3.9 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT40C-110R



Magnification	4.0×
F No.	22.0
Object side NA	0.091
WD	112mm
OI	260.0mm
Depth of field	0.11mm
Resolution	3.7 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

FT60C-110R



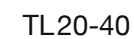
Magnification	6.0×
F No.	33.0
Object side NA	0.091
WD	112mm
OI	270.4mm
Depth of field	0.07mm
Resolution	3.7 μ
TV distortion	0.00%
Maximum Compatible sensor	2/3
Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.



Short WD: WD40mm

- Suitable for small device and limited space
- $\phi 16\text{mm}$ telecentric lens
- Suitable for bonding, chip mounter, etc..



Magnification	4x	Depth of field	0.14mm
F No.	28.2	Resolution	4.7 μ
Object side NA	0.071	TV distortion	-0.19%
WD	41.2mm	Maximum Compatible sensor	1/2
OI	106mm	Mount	C

Magnification	6x	Depth of field	0.09mm
F No.	41.6	Resolution	4.7 μ m
Object side NA	0.072	TV distortion	-0.10%
WD	41.2mm	Maximum Compatible sensor	1/2"
OI	118mm	Mount	C

Magnification	1×	Depth of field	0.83mm
F No.	10.4	Resolution	7.0μm
Object side NA	0.048	TV distortion	0.00%
WD	40.1mm	Maximum Compatible sensor	1/2"
OI	100.8mm	Mount	C

Magnification	2x	Depth of field	0.28mm
F No.	14.1	Resolution	4.7 μ m
Object side NA	0.071	TV distortion	0.13%
WD	41.2mm	Maximum Compatible sensor	1/2"
OI	98mm	Mount	C

Magnification	4x	Depth of field	0.14mm
F No.	28.2	Resolution	4.7 μ m
Object side NA	0.071	TV distortion	-0.19%
WD	41.2mm	Maximum Compatible sensor	1/2"
OI	106mm	Mount	C

Magnification	6x	Depth of field	0.09mm
F No.	41.6	Resolution	4.7 μ m
Object side NA	0.072	TV distortion	-0.10%
WD	41.2mm	Maximum Compatible sensor	1/2"
OI	118mm	Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μ m.

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1/2" - 2/3"

WD65 Built-in type Telecentric Lens

Middle WD: WD65mm

- Short OI and High NA
- φ16mm telecentric lens
- R type is improved contrast and relative illumination



TL40-65 <table><tr><td>Magnification</td><td>4x</td></tr><tr><td>F No.</td><td>26.0</td></tr><tr><td>Object side NA</td><td>0.077</td></tr><tr><td>WD</td><td>65mm</td></tr><tr><td>OI</td><td>150mm</td></tr><tr><td>Depth of field</td><td>0.13mm</td></tr><tr><td>Resolution</td><td>4.36 μm</td></tr><tr><td>TV distortion</td><td>0.30%</td></tr><tr><td>Maximum Compatible sensor</td><td>2/3"</td></tr><tr><td>Mount</td><td>C</td></tr></table>	Magnification	4x	F No.	26.0	Object side NA	0.077	WD	65mm	OI	150mm	Depth of field	0.13mm	Resolution	4.36 μm	TV distortion	0.30%	Maximum Compatible sensor	2/3"	Mount	C	TL60-65 <table><tr><td>Magnification</td><td>6x</td></tr><tr><td>F No.</td><td>39.0</td></tr><tr><td>Object side NA</td><td>0.077</td></tr><tr><td>WD</td><td>65mm</td></tr><tr><td>OI</td><td>163mm</td></tr><tr><td>Depth of field</td><td>0.09mm</td></tr><tr><td>Resolution</td><td>4.36 μm</td></tr><tr><td>TV distortion</td><td>0.33%</td></tr><tr><td>Maximum Compatible sensor</td><td>2/3"</td></tr><tr><td>Mount</td><td>C</td></tr></table>	Magnification	6x	F No.	39.0	Object side NA	0.077	WD	65mm	OI	163mm	Depth of field	0.09mm	Resolution	4.36 μm	TV distortion	0.33%	Maximum Compatible sensor	2/3"	Mount	C	TL80-65 <table><tr><td>Magnification</td><td>8x</td></tr><tr><td>F No.</td><td>52.0</td></tr><tr><td>Object side NA</td><td>0.077</td></tr><tr><td>WD</td><td>65mm</td></tr><tr><td>OI</td><td>180mm</td></tr><tr><td>Depth of field</td><td>0.07mm</td></tr><tr><td>Resolution</td><td>4.36 μm</td></tr><tr><td>TV distortion</td><td>0.20%</td></tr><tr><td>Maximum Compatible sensor</td><td>2/3"</td></tr><tr><td>Mount</td><td>C</td></tr></table>	Magnification	8x	F No.	52.0	Object side NA	0.077	WD	65mm	OI	180mm	Depth of field	0.07mm	Resolution	4.36 μm	TV distortion	0.20%	Maximum Compatible sensor	2/3"	Mount	C	TL08C-65R <table><tr><td>Magnification</td><td>0.8x</td></tr><tr><td>F No.</td><td>14.8</td></tr><tr><td>Object side NA</td><td>0.027</td></tr><tr><td>WD</td><td>65mm</td></tr><tr><td>OI</td><td>166mm</td></tr><tr><td>Depth of field</td><td>1.85mm</td></tr><tr><td>Resolution</td><td>12.3 μm</td></tr><tr><td>TV distortion</td><td>0.00%</td></tr><tr><td>Maximum Compatible sensor</td><td>1/1.8"</td></tr><tr><td>Mount</td><td>C</td></tr></table>	Magnification	0.8x	F No.	14.8	Object side NA	0.027	WD	65mm	OI	166mm	Depth of field	1.85mm	Resolution	12.3 μm	TV distortion	0.00%	Maximum Compatible sensor	1/1.8"	Mount	C
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TL10C-65R <table><tr><td>Magnification</td><td>1x</td></tr><tr><td>F No.</td><td>18.5</td></tr><tr><td>Object side NA</td><td>0.027</td></tr><tr><td>WD</td><td>65mm</td></tr><tr><td>OI</td><td>166mm</td></tr><tr><td>Depth of field</td><td>1.48mm</td></tr><tr><td>Resolution</td><td>12.4 μm</td></tr><tr><td>TV distortion</td><td>0.00%</td></tr><tr><td>Maximum Compatible sensor</td><td>1/1.8"</td></tr><tr><td>Mount</td><td>C</td></tr></table>	Magnification	1x	F No.	18.5	Object side NA	0.027	WD	65mm	OI	166mm	Depth of field	1.48mm	Resolution	12.4 μm	TV distortion	0.00%	Maximum Compatible sensor	1/1.8"	Mount	C	TL15C-65R <table><tr><td>Magnification</td><td>1.5x</td></tr><tr><td>F No.</td><td>16.0</td></tr><tr><td>Object side NA</td><td>0.047</td></tr><tr><td>WD</td><td>65mm</td></tr><tr><td>OI</td><td>150mm</td></tr><tr><td>Depth of field</td><td>0.57mm</td></tr><tr><td>Resolution</td><td>7.22 μm</td></tr><tr><td>TV distortion</td><td>0.00%</td></tr><tr><td>Maximum Compatible sensor</td><td>1/1.8"</td></tr><tr><td>Mount</td><td>C</td></tr></table>	Magnification	1.5x	F No.	16.0	Object side NA	0.047	WD	65mm	OI	150mm	Depth of field	0.57mm	Resolution	7.22 μm	TV distortion	0.00%	Maximum Compatible sensor	1/1.8"	Mount	C	TL20C-65R <table><tr><td>Magnification</td><td>2x</td></tr><tr><td>F No.</td><td>16.7</td></tr><tr><td>Object side NA</td><td>0.06</td></tr><tr><td>WD</td><td>65mm</td></tr><tr><td>OI</td><td>152mm</td></tr><tr><td>Depth of field</td><td>0.33mm</td></tr><tr><td>Resolution</td><td>5.6 μm</td></tr><tr><td>TV distortion</td><td>-0.01%</td></tr><tr><td>Maximum Compatible sensor</td><td>1/2"</td></tr><tr><td>Mount</td><td>C</td></tr></table>	Magnification	2x	F No.	16.7	Object side NA	0.06	WD	65mm	OI	152mm	Depth of field	0.33mm	Resolution	5.6 μm	TV distortion	-0.01%	Maximum Compatible sensor	1/2"	Mount	C	TL40C-65 <table><tr><td>Magnification</td><td>4x</td></tr><tr><td>F No.</td><td>26.0</td></tr><tr><td>Object side NA</td><td>0.077</td></tr><tr><td>WD</td><td>65mm</td></tr><tr><td>OI</td><td>150mm</td></tr><tr><td>Depth of field</td><td>0.13mm</td></tr><tr><td>Resolution</td><td>4.36 μm</td></tr><tr><td>TV distortion</td><td>0.30%</td></tr><tr><td>Maximum Compatible sensor</td><td>2/3"</td></tr><tr><td>Mount</td><td>C</td></tr></table>	Magnification	4x	F No.	26.0	Object side NA	0.077	WD	65mm	OI	150mm	Depth of field	0.13mm	Resolution	4.36 μm	TV distortion	0.30%	Maximum Compatible sensor	2/3"	Mount	C
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1/2" - 2/3"

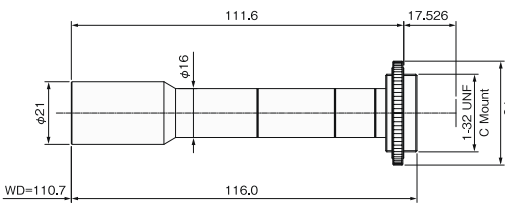
WD110 Built-in type Telecentric Lens

Long WD: 110mm

- Compact and suitable for customized optical systems
- φ16mm telecentric lens
- R type is improved contrast and relative illumination

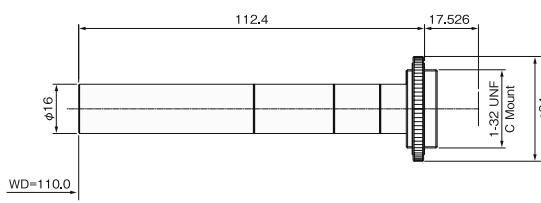


TL08-110R



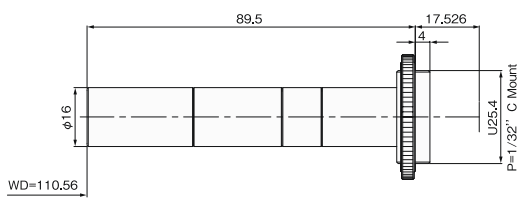
Magnification	0.8x	Depth of field	2.09mm
F No.	16.7	Resolution	14 μ
Object side NA	0.024	TV distortion	0.00%
WD	111mm	Maximum Compatible sensor	1/1.8
OI	240mm	Mount	C

TL10-110R



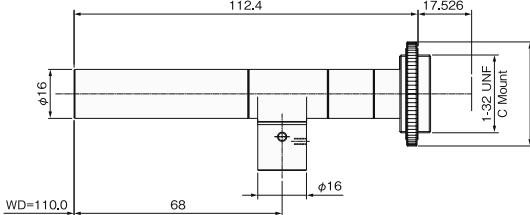
Magnification	1x	Depth of field	1.67mm
F No.	20.9	Resolution	14 μ
Object side NA	0.024	TV distortion	0.00%
WD	110mm	Maximum Compatible sensor	1/1.8
OI	240mm	Mount	C

TL20-110R



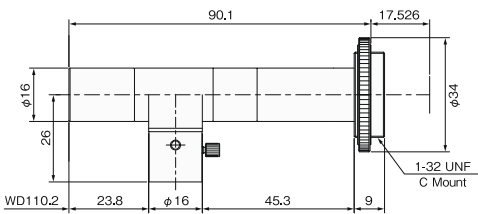
Magnification	2x	Depth of field	0.67mm
F No.	33.45	Resolution	11.2 μ
Object side NA	0.03	TV distortion	-0.03%
WD	110mm	Maximum Compatible sensor	1/2
OI	218mm	Mount	C

TL10C-110R



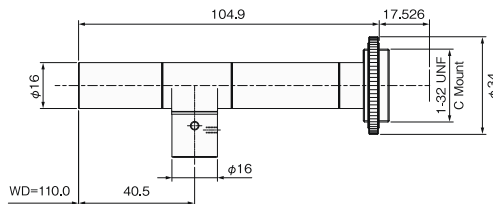
Magnification	1x	Depth of field	1.67mm
F No.	20.9	Resolution	14 μ
Object side NA	0.024	TV distortion	0.00%
WD	110mm	Maximum Compatible sensor	1/1.8
OI	240mm	Mount	C

TL30C-110



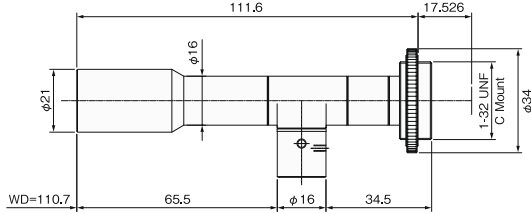
Magnification	3x	Depth of field	0.27mm
F No.	30.4	Resolution	6.8 μ
Object side NA	0.049	TV distortion	0.06%
WD	110mm	Maximum Compatible sensor	2/3
OI	218mm	Mount	C

TL60C-110R



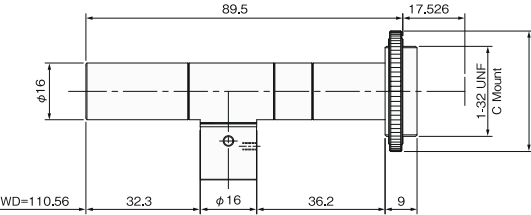
Magnification	6x	Depth of field	0.15mm
F No.	66.7	Resolution	7.5 μ
Object side NA	0.045	TV distortion	0.00%
WD	110mm	Maximum Compatible sensor	1/1.8
OI	232mm	Mount	C

TL08C-110R



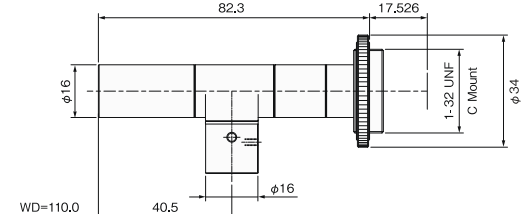
Magnification	0.8x	Depth of field	2.09mm
F No.	16.7	Resolution	14 μ
Object side NA	0.024	TV distortion	0.00%
WD	111mm	Maximum Compatible sensor	1/1.8
OI	240mm	Mount	C

TL20C-110R



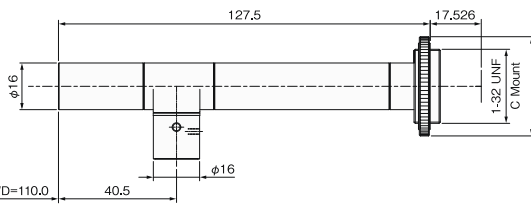
Magnification	2x	Depth of field	0.67mm
F No.	33.45	Resolution	11.2 μ
Object side NA	0.03	TV distortion	-0.03%
WD	110mm	Maximum Compatible sensor	1/2
OI	218mm	Mount	C

TL40C-110R



Magnification	4x	Depth of field	0.22mm
F No.	44.4	Resolution	7.5 μ
Object side NA	0.045	TV distortion	0.00%
WD	110mm	Maximum Compatible sensor	1/1.8
OI	210mm	Mount	C

TL80C-110R



Magnification	8x	Depth of field	0.11mm
F No.	88.9	Resolution	7.5 μ
Object side NA	0.045	TV distortion	0.00%
WD	110mm	Maximum Compatible sensor	1/1.8
OI	255mm	Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.

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1/1.8"

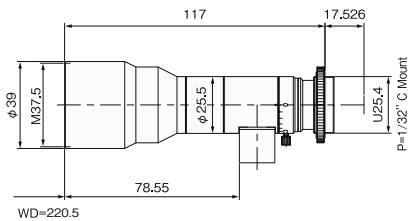
WD220 Built-in type Telecentric Lens

Long WD: 220mm

- High resolution and compact design
- Suitable for various applications, alignment, inspection, measurement, etc..
- Adjustable iris for 0.5x and 0.7x
- Compatible with 3 Mega Pixel of 1/1.8"

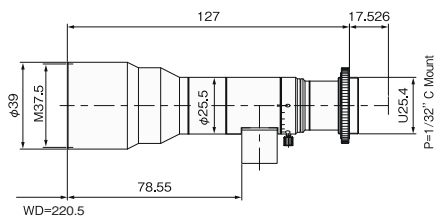


TL05C-220



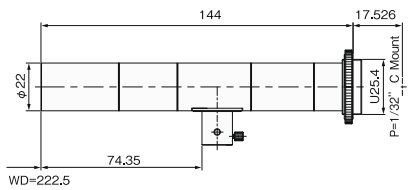
Magnification	0.5x	Depth of field	2.17mm
F No.	6.79	Resolution	9.1 μ
Object side NA	0.037	TV distortion	0.02%
WD	220.5mm	Maximum Compatible sensor	1/1.8
OI	355mm	Mount	C

TL07C-220



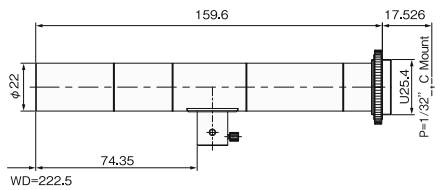
Magnification	0.7x	Depth of field	1.55mm
F No.	9.50	Resolution	9.1 μ
Object side NA	0.037	TV distortion	0.02%
WD	220.5mm	Maximum Compatible sensor	1/1.8
OI	365mm	Mount	C

TL10C-220



Magnification	1x	Depth of field	1.07mm
F No.	13.35	Resolution	9.0 μ
Object side NA	0.037	TV distortion	0.00%
WD	222.5mm	Maximum Compatible sensor	1/1.8
OI	384mm	Mount	C

TL20C-220



Magnification	2x	Depth of field	0.53mm
F No.	26.42	Resolution	8.8 μ
Object side NA	0.038	TV distortion	0.04%
WD	222.5mm	Maximum Compatible sensor	1/1.8
OI	400mm	Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.

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2/3"

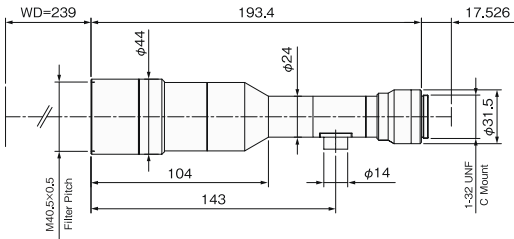
WD240 High Magnification Telecentric Lens

Long WD: 240mm

- Suitable for vacuum chamber, working environment in high temperature, etc., required for long WD
- 4x and 6x are available
- All models are designed for co-axial illumination

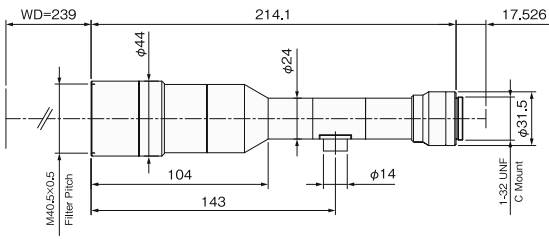


TL40C-240



Magnification	4x	Depth of field	0.14mm
F No.	28.6	Resolution	4.8 μ
Object side NA	0.07	TV distortion	0.22%
WD	239mm	Maximum Compatible sensor	2/3
OI	449.9mm	Mount	C

TL60C-240



Magnification	6x	Depth of field	0.1mm
F No.	42.9	Resolution	4.8 μ
Object side NA	0.07	TV distortion	0.0%
WD	239mm	Maximum Compatible sensor	2/3
OI	470.6mm	Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.

□□□□□□

1/1.8"- 2/3"

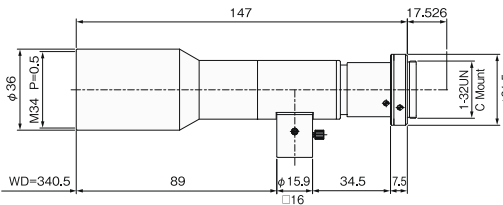
WD300 Telecentric Lens

Long WD: 310mm and 340mm

- ❖ Suitable for applications required for long WD
- ❖ Long WD, over 300mm
- ❖ TL10C-310 is compatible with 2/3"
- ❖ TV distortion is less than 0.00%



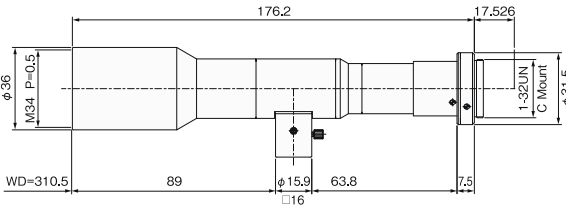
TL07C-340



Magnification	0.7x	Depth of field	1.9mm
F No.	11.6	Resolution	11.2 μ
Object side NA	0.03	TV distortion	0.00%
WD	340.5mm	Maximum Compatible sensor	1/1.8
OI	505mm	Mount	C

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.

TL10C-310



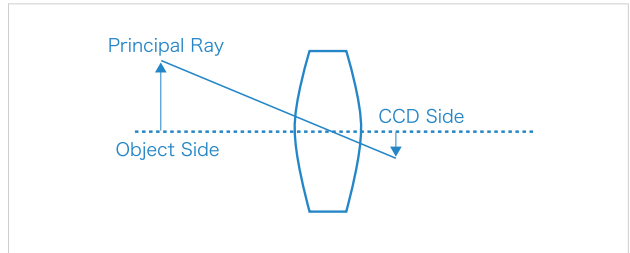
Magnification	1.0x	Depth of field	1.2mm
F No.	15.5	Resolution	10.5 μ
Object side NA	0.032	TV distortion	0.00%
WD	310.5mm	Maximum Compatible sensor	2/3
OI	504mm	Mount	C

Telecentric Lens for Image Processing

The most suitable optical system for measurement in high accuracy

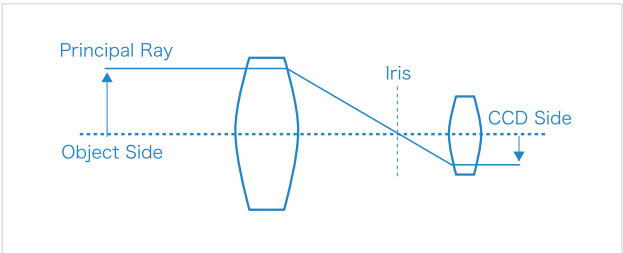
Telecentric optical system is an optical design that where the principal ray in parallel to the optical axis. It eliminates distortion problems by collimating the light entering the lens and suitable for imaging 3D objects. Co-axial illumination is suitable for recognizing object with high reflectance such as wafer, glass, and metal.

❖ Non-telecentric lens



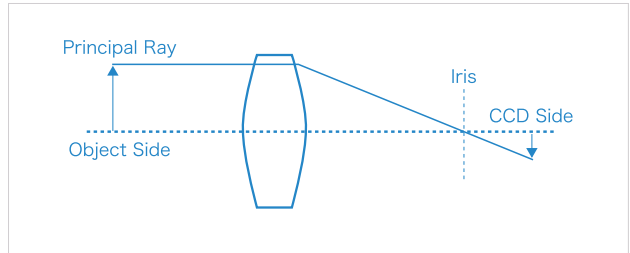
- ❖ Smaller size
- ❖ The number of lenses is fewer.
- ❖ Object size changes as the object goes up and down.

❖ Double side telecentric lens



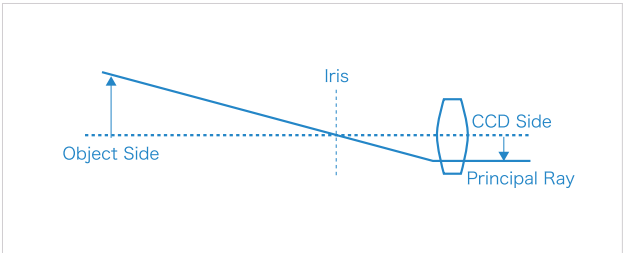
- ❖ Primary lays of object and image side are parallel to optical axis.
- ❖ Object size does not change when object goes up and down.
- ❖ Large size and high cost

❖ Object side telecentric lens



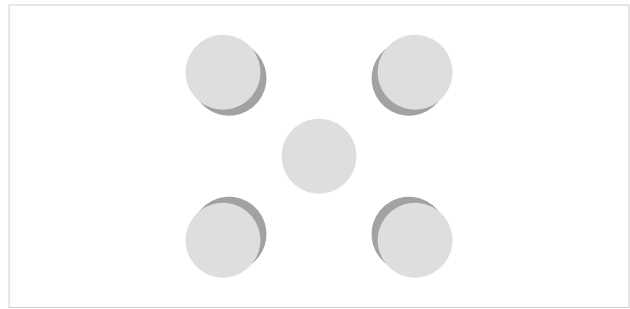
- ❖ Principal ray of object side is parallel to optical axis.
- ❖ Required for co-axial illumination
- ❖ Object size does not change when object goes up and down.
- ❖ Small size, compared to double side telecentric lens

❖ Image side telecentric lens



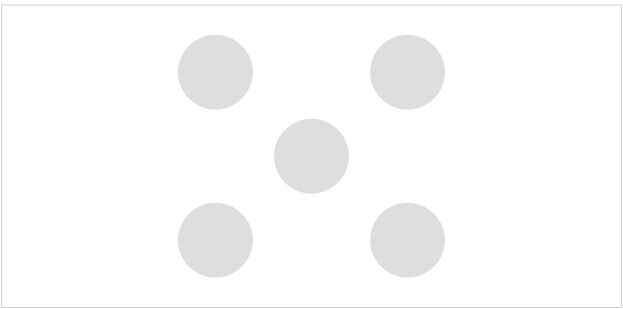
- ❖ Principal ray of image side is parallel to optical axis.
- ❖ Object size changes when object size goes up and down.
- ❖ A lens for video camera should be this optical system to correct color aberration.

Standard Lens



Size of 3D object changes when it goes up and down when non-telecentric lens is used. Telecentric lens is suitable for accurate measurement of 3D object.

Telecentric lens



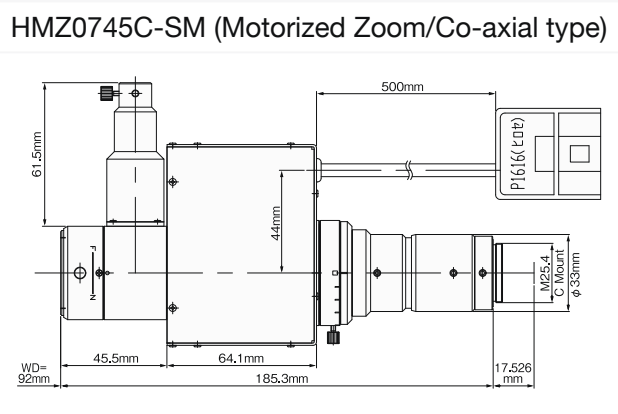
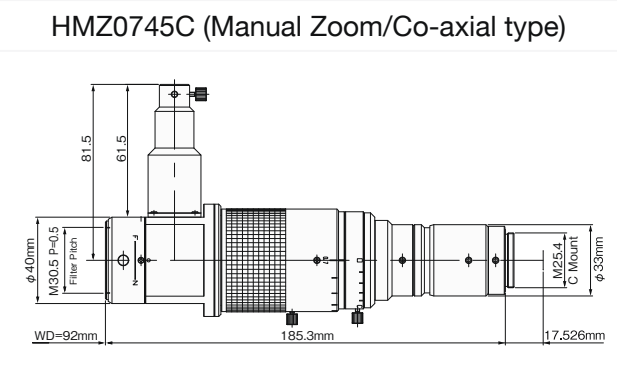
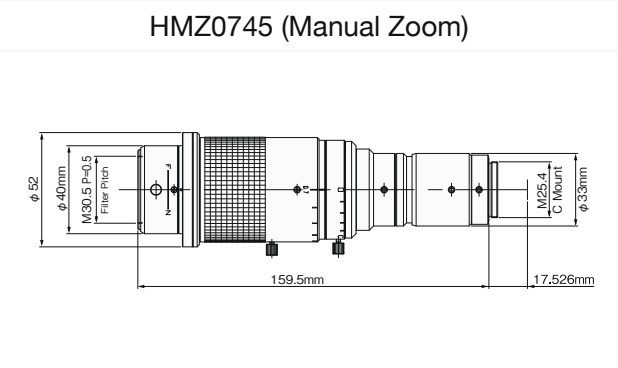
00000000

1/1.8"

High Resolution Macro Zoom Lens

High resolution and compact design

- Compatible with 1/1.8" of Mega Pixel camera
- High resolution and compact design
- High contrast and low distortion
- Improve uniformity of brightness for co-axial illumination
- Magnification and working distance can be converted to 0.21x - 18x, WD37 - 329mm by using converters



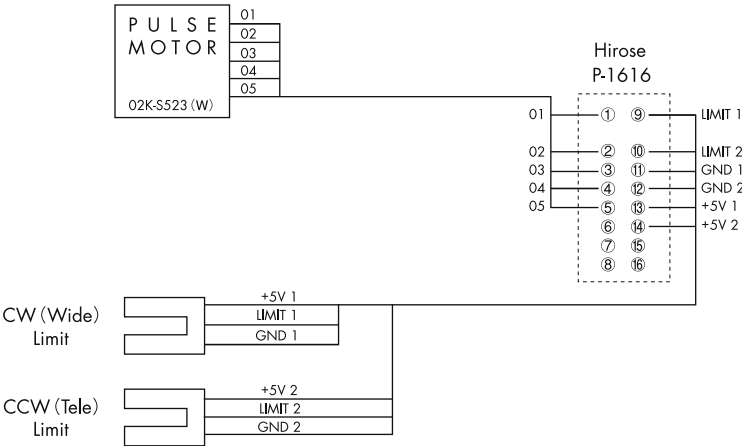
Lens			
Model	HMZ0745 / HMZ0745C / HMZ0745C-SM		
Magnification	0.7× - 4.5×	Depth of field	2mm - 0.08mm
WD	92mm	TV distortion	0.05% - 0.08%
Resolution	11.5 μ - 2.87 μ	Maximum Compatible sensor	1/1.8
Object side NA	0.03 - 0.12		

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm.

Front Converter		
Model	Magnification	WD with converter
HMZ-FC03	0.3×	329mm
HMZ-FC04	0.4×	235mm
HMZ-FC05	0.5×	182mm
HMZ-FC067	0.67×	118mm
HMZ-FC20	2.0×	37mm

Rear Converter	
Model	Magnification
HMZ-RC20	2.0×

(Wiring Diagram) HMZ0745C-SM





1/3"

Suitable for various applications, inspection of wafer, IC chip, etc...

- 10x Zoom (0.2x - 2.0x)
- Compact design of 10x zoom ratio
- Reduce relative illumination
- High resolution at the whole magnification
- Motorized zoom type is available
- Long WD, 227mm

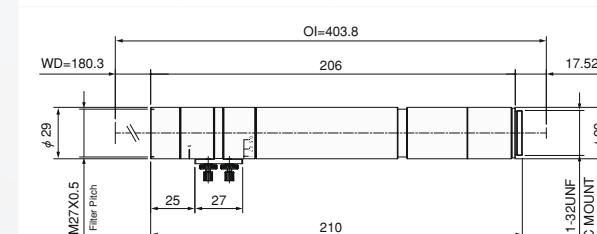


Compact and wide zoom ratio, suitable for inspection of various objects

- ❖ Long WD, 180mm
- ❖ Focus function is available
- ❖ $\varnothing 29\text{mm}$, suitable for small and limited spaces



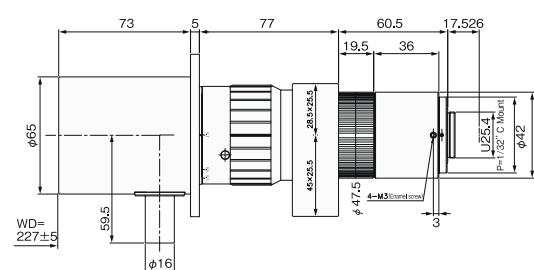
CMZ0540-2



Magnification	0.5x~4.0x	Depth of field	3.3~0.19mm
WD	180.3mm	TV distortion	0.02%
Resolution	14 μ ~6.3 μ	Maximum Compatible sensor	1/3
Object side NA	0.024~0.053		

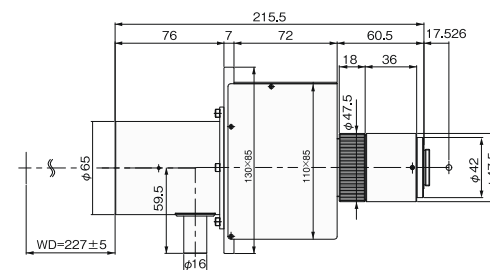
- * Indicated specifications are design values.
- * Resolution indicates a theoretical resolution at a wavelength of 550nm.
- * Depth of field is calculated assuming permissible circle of confusion is 40 μm .

TLZ0220C-SM (Motorized Zoom)



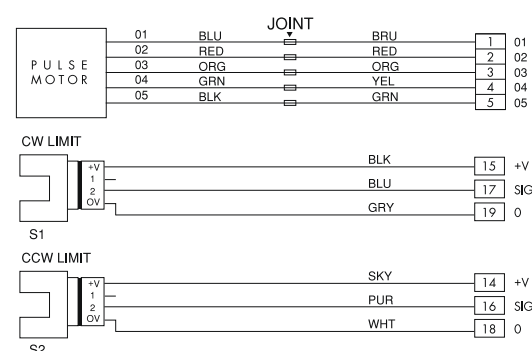
Magnification	0.2x-2.0x	Depth of field	13.1mm -0.45mm
WD	227mm	TV distortion	-0.16% - 0.16%
Resolution	22.4 μ - 7.6 μ	Maximum	1/1.8
Object side NA	0.015 - 0.044	Compatible sensor	

* Indicated specifications are design values. * Resolution indicates a theoretical resolution at a wavelength of 550nm.
* Depth of field is calculated assuming permissible circle of confusion is 40 μm .



Magnification	0.2x - 2.0x	Depth of field	13.1mm - 0.45mm
WD	227mm	TV distortion	-0.16% - 0.16%
Resolution	22.4μ - 7.6μ	Maximum	1/1.8
Object side NA	0.015 - 0.044	Compatible sensor	

(Wiring Diagram) TLZ0220C-SM



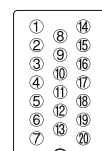
1	01
2	02
3	03
4	04
5	05
6	
7	

8	
9	
10	
11	
12	
13	

14	S2-++
15	S1-++
16	S2-SIG
17	S1-SIG
18	S2-0W
19	S1-0W
20	

PIN ASSIGNMENT

PIN LOCATION

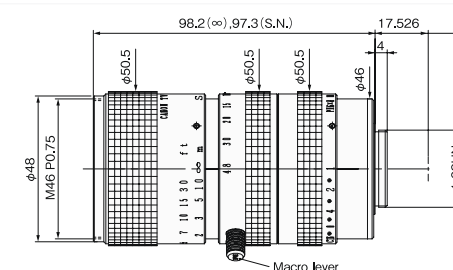


1/2"

Suitable for high speed applications

- WD500mm - ∞
 - *Macro photography: Possible to use at WD10mm by pulling a macro lever
- Large aperture, suitable for high speed camera

PH6 x 8Macro



Model Focal length (Zoom Ratio)	8 - 48mm (6.0x)	Magnification at WD500mm	0.017 - 0.1
∞ F No.	1.0	Filter Pitch	M46 P=75
WD	500mm - ∞	Maximum Compatible sensor	1/2

* Indicated specifications are design values.



固定焦点C接口镜头

Sensor size Chart for Fixed Focal Lens

Series	Model No.	1/2	1/1.8	2/3	1	1.1	1.2	4/3	Page
4/3" 21-25 Mega Pixel MS-C Series	MS1828-C								P73
	MS2524-C								
	MS3520-C								
8 Mega Pixel HF-DN Series	HF1216V DN								P75
	HF1616V DN								
	HF2516V DN								
	HF3516V DN								
	HF5018V DN								
	HF7520V DN								
	VV1618HF DN								
5-12Mega Pixel HF Series	HF0528J-2								P76
	HF0818J-2								
	HF1214J-2								
	HF1218V								
	HF1618V-2								
	HF2514V-2								
	HF3514V-2								
	HF5018V-2								
	HF7518V-2								
4-12Mega Pixel HS-V Series	HS0619V								P79
	HS0818V								
	HS1214V								
	HS1614V								
	HS2514V								
	HS3516V								
	HS5016V								
	HS7520V								
	HS10028V								
SWIR HS-V-SW Series	HS0619V-SW								P81
	HS0818V-SW								
	HS1214V-SW								
	HS1614V-SW								
	HS2514V-SW								
	HS3516V-SW								
	HS5016V-SW								
	HS7520V-SW								
	HS10028V-SW								
Resistance against vibration RV Series	RV0420								P82
	RV0622								
	RV0814								
	RV1022								
	RV1214								
	RV1520								
	RV2020								
	RV2520								
	RV3020								
	RV3519								
	RV5025								
	RV7538								

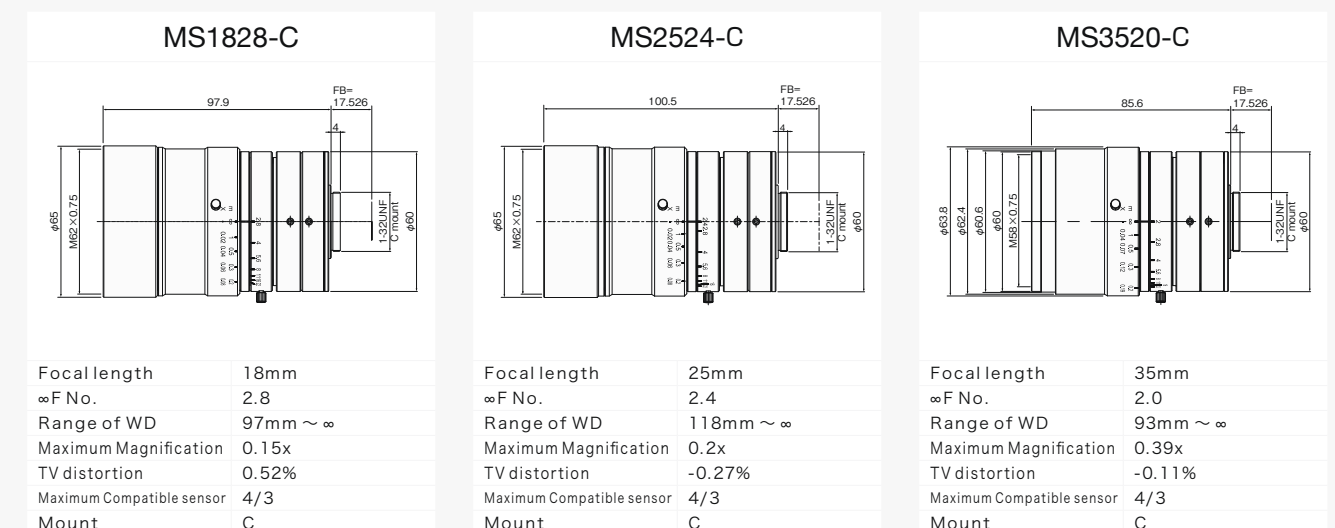
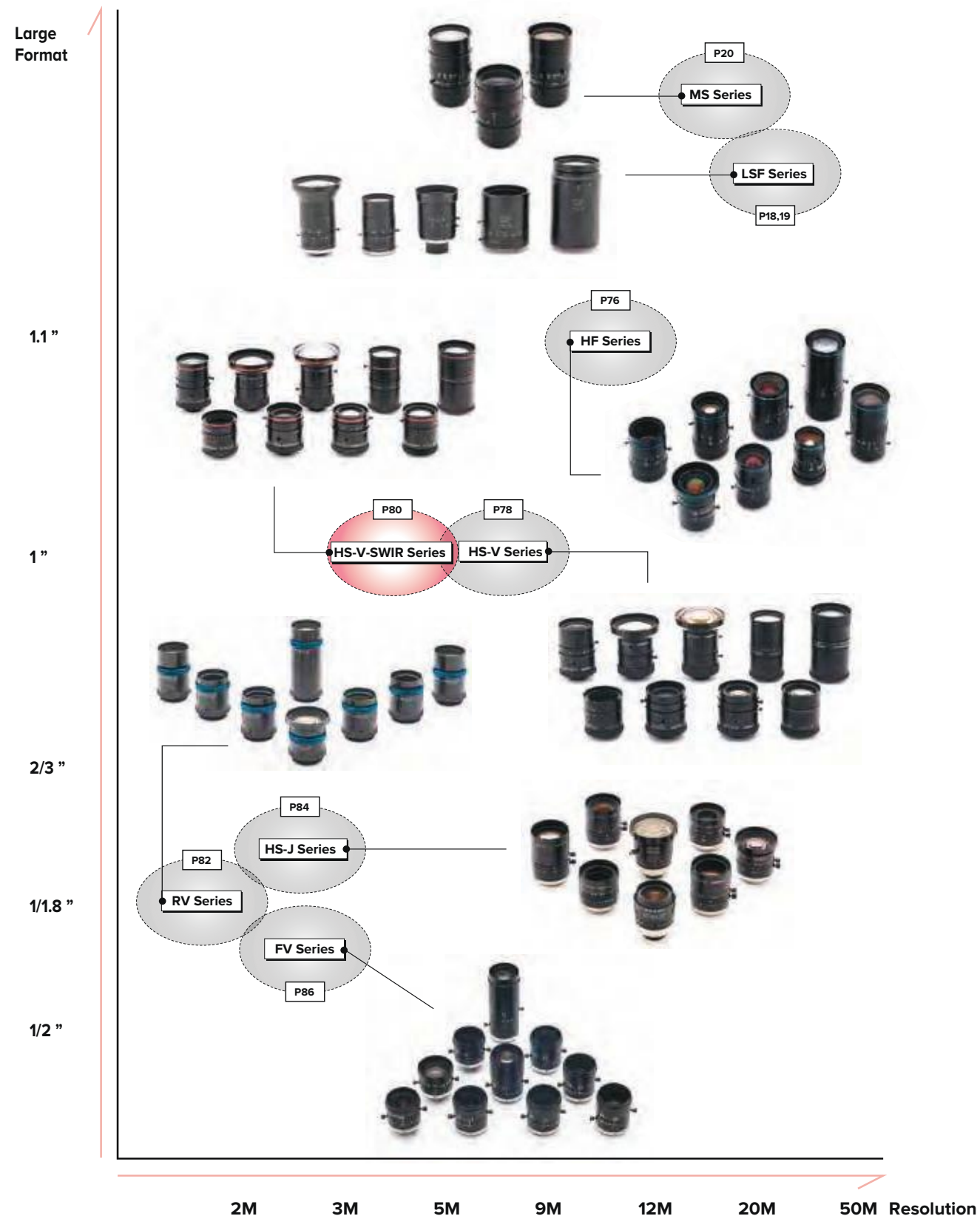
Series	Model No.	1/2	1/1.8	2/3	1	1.1	1.2	4/3	Page
3Mega Pixel HS Series	HS0420H								P84
	HS0618H								
	HS0814J								
	HS1214J								
	HS1614J								
	HS2514J								
	HS3514J								
Low distortion FV Series	HS5018J								P86
	FV0420								
	FV0622								
	FV1022								
	FV1520								
	FV2020								
	FV2520								
	FV3020								
	FV3519								
MV Series	FV5025								P88
	FV7538								
	MV0316								
	MV0614								
	MV0813								
	MV1214								
	MV1614								
	MV2514								
	MV3519								
	MV5018								
	MV7527								
	MV10035								

□ □ □ □ □ □ □

4/3"

High resolution, low distortion lens for 4/3", 21 and 25 Mega Pixel

- ❖ Possible to capture wide view with c mount full size camera
- ❖ Excellent relative illumination
- ❖ Stable performance from macro to infinity by floating design



* Indicated specifications are design values.

* TV distortion indicates a value for minimum working distance.

NEW 8MP 1" NIR

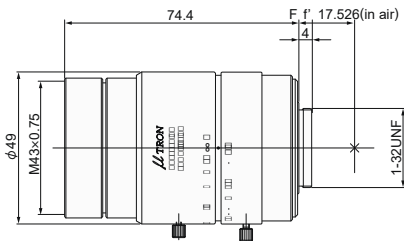
8 Mega Pixel Visible-NIR Chromatic aberration corrected lens

4K resolution

- f12mm, 16mm, 25mm, 35mm, 50mm, 75mm are available for Fixed Focal Lens
- f16-50mm is available for Varifocal Lens
- 400nm-950nm Focus Shift correction
- Realizes color reproduction in color images
- Super high resolution, Low distortion, and excellent uniformity of brightness
- Line up : Extension ring for close-up purpose

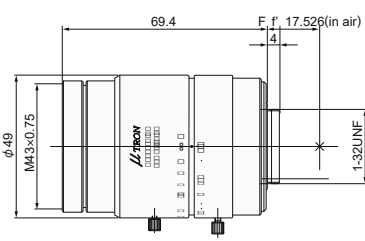


HF1216V DN



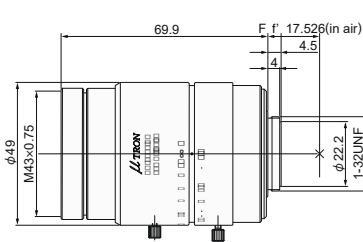
Focal length	12mm	Angle of view (H x V)	28.3° x 21.8°
∞F No.	1.6	Filter pitch	M43 P=0.75
Range of WD	0.8m - ∞	Maximum Compatible sensor	1"

HF1616V DN



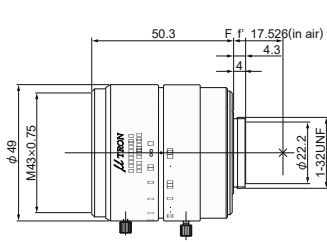
Focal length	16mm	Angle of view (H x V)	21.9° x 16.6°
∞F No.	1.6	Filter pitch	M43 P=0.75
Range of WD	0.8m - ∞	Maximum Compatible sensor	1"

HF2516V DN



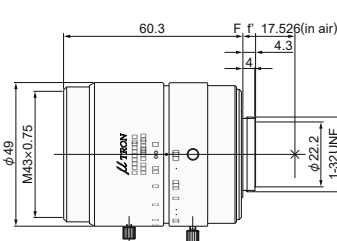
Focal length	25mm	Angle of view (H x V)	28.2° x 21.2°
∞F No.	1.6	Filter pitch	M43 P=0.75
Range of WD	1.0m - ∞	Maximum Compatible sensor	1"

HF3516V DN



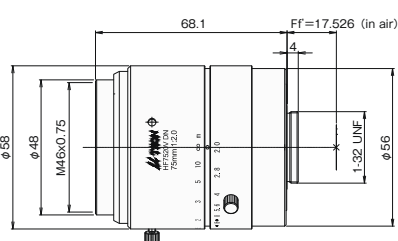
Focal length	35mm	Angle of view (H x V)	20.8° x 15.6°
∞F No.	1.6	Filter pitch	M43 P=0.75
Range of WD	1.5m - ∞	Maximum Compatible sensor	1"

HF5018V DN



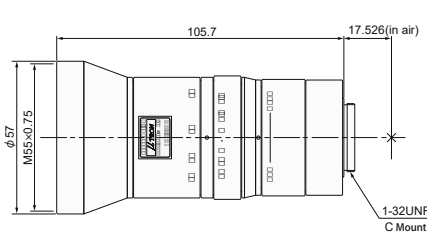
Focal length	50mm	Angle of view (H x V)	15.0° x 11.2°
∞F No.	1.8	Filter pitch	M43 P=0.75
Range of WD	1.5m - ∞	Maximum Compatible sensor	1"

HF7520V DN



Focal length	75mm	Angle of view (H x V)	10.0° x 7.5°
∞F No.	2.0	Filter pitch	M46 P=0.75
Range of WD	1.5m - ∞	Maximum Compatible sensor	1"

VV1618HF DN



Focal length	16~50mm	Angle of view (H x V)	Wide 44.4°x33.4° Tele 14.9°x11.3°
∞F No.	1.8	Filter pitch	M55 P=0.75
Range of WD	2m - ∞	Maximum Compatible sensor	1"

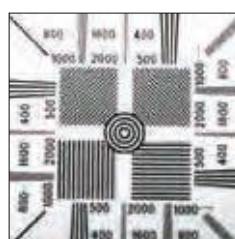
* Indicated specifications are design values.



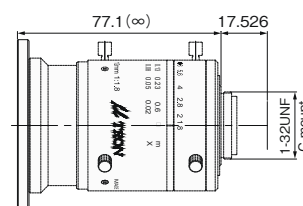
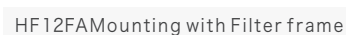
Suitable for inspection and alignment , required for high accuracy

- ▶ f12mm, HF1218V is suitable for 25 Mega Pixel and 12 Mega Pixel
- ▶ f16mm - f75mm are compatible with 1.1" - 1.2"
- ▶ Suitable for different types of sensor
- ▶ Excellent performance at macro imaging, compared with conventional Mega Pixel Fixed Focal lens
- ▶ Stable performance at different working distance by floating design
- ▶ Large aperture
- ▶ Robust design, suitable for machine vision applications

Mega Pixel Lens

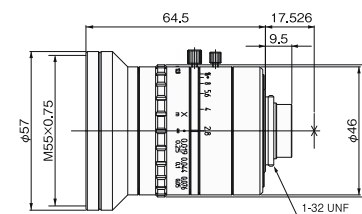


❖ Suitable for 25MP (2.5 $\mu\text{m}/\text{Pixel}$), 12MP (3.45 $\mu\text{m}/\text{Pixel}$)



Focal length	12mm	TV distortion	-0.10%
∞F No.	1.8	Filter pitch	M62 P=0.75(OPTION)
Range of WD	100mm - ∞	Maximum Compatible sensor	1.1"
Maximum Magnification	0.1x		

* Indicated specifications are design values. * TV distortion indicates a value for minimum working distance.
* Angle of view indicates a value for maximum compatible sensor.



Focal length	5mm	TV distortion	0.29%
∞F No.	2.8	Filter pitch	M55 P=0.75
Range of WD	50mm - ∞	Maximum Compatible sensor	2/3
Maximum Magnification	0.076x		

Technical drawing of the front view of a cylindrical component. The drawing shows a cylinder with a total length of 73.2 (0.1) mm. The main body has a diameter of 46 mm, and the front flange has a diameter of 42 mm. The flange thickness is 17.52 mm. A central hole has a diameter of 4 mm. The drawing includes a section line A-A and a detail view of the flange edge showing a 1:3 scale. The drawing is labeled with dimensions and tolerances.

Focal length	8mm	TV distortion	0.31%
∞F No.	1.8	Filter pitch	M40.5 P=0.5
Range of WD	100mm - ∞	Maximum Compatible sensor	2/3
Maximum Magnification	0.078x		

Technical drawing of the front view of a 1/2" NPT female adapter. The drawing shows a cylindrical body with a threaded section on the left and a flanged section on the right. Dimensions are provided in millimeters: overall length 62, flange thickness 17.526, and various diameters (42, 40.5, 39, 20.5). Thread specifications M37.5 P=0.5 and 1-32 UNF are indicated.

Focal length	12mm	TV distortion	-0.31%
∞F No.	1.4	Filter pitch	M37.5 P=0.5
Range of WD	100mm - ∞	Maximum Compatible sensor	2/3
Maximum Magnification	0.1x		

Technical drawing of a shaft assembly. The shaft has a diameter of $\phi 51$ and a thread of $M49 \times 0.75$. The total length is 91.5. The distance from the left end to the start of the thread is 17.526. The distance from the start of the thread to the right end is 5.5. The thread is specified as $5H/6h$. The distance from the right end to the start of the thread is 1.32. The drawing includes a cross-section view of the shaft with a keyway and a detail view of the thread.

Focal length	16mm	TV distortion	-0.28%
∞F No.	1.8	Filter pitch	M49 P=0.75
Range of WD	33mm - ∞	Maximum Compatible sensor	1.1
Maximum Magnification	0.3x		

[illegible]

Focal length	25mm	TV distortion	-0.09%
∞F No.	1.4	Filter pitch	M52 P=0.75
Range of WD	80mm - ∞	Maximum Compatible sensor	1.1
Maximum Magnification	0.3x		

Focal length	35mm	TV distortion	-0.027%
∞F No.	1.4	Filter pitch	M46 P=0.75mm
Range of WD	110mm - ∞	Maximum Compatible sensor	1.1
Maximum Magnification	0.3x		

Focal length	50mm	TV distortion	-0.01%
∞F No.	1.8	Filter pitch	M49 P=0.75
Range of WD	192mm - ∞	Maximum Compatible sensor	1.2
Maximum Magnification	0.3x		

* Indicated specifications are design values. * TV distortion indicates a value for minimum working distance.
* Angle of view indicates a value for maximum compatible sensor.

Technical drawing of a shaft assembly. The shaft has a diameter of $\phi 57$ and a length of $M55 \times 0.75$. The total length of the assembly is 116.5 . The distance from the left end of the shaft to the center of the bearing is 17.526 . The bearing is labeled 6208 and has a bore diameter of $\phi 57$. The shaft is labeled $1:32 UNF$.

Focal length	75mm	TV distortion	0.00%
∞F No.	1.8	Filter pitch	M55 P=0.75mm
Range of WD	290mm - ∞	Maximum Compatible sensor	1.2
Maximum Magnification	0.3x		

□ □ □ □ □ □ □ □

4-12MP

1"-1.1"

High Resolution Fixed Focal Lens for 1"-1.1"

Suitable for 4 MP, 5MP, 9MP for 1", 12MP for 1.1"

- Suitable for 1" and 1.1"(3.45μm/pixel)
- Compact design
- Stable performance at different working distance, from macro to infinity by floating design
- Robust design
- f35mm, 50mm, 75mm and 100mm are suitable for 1.1" (φ17.4mm)



HS0619V

Focal length	6mm
∞F No.	1.9
Range of WD	100mm ~ ∞
TV distortion	0.83%
Angle of view (HxV)	94.7°×78.1°
Maximum Compatible sensor	1"
Mount	C

HS0818V

Focal length	8mm
∞F No.	1.8
Range of WD	100mm ~ ∞
TV distortion	-0.17%
Angle of view (HxV)	78.1°×62.1°
Filter pitch	M58 P=0.75
Maximum Compatible sensor	1"
Mount	C

HS1214V

Focal length	12.5mm
∞F No.	1.4
Range of WD	300mm ~ ∞
TV distortion	-0.69%
Angle of view (HxV)	54.9°×42.2°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1"
Mount	C

HS1614V

Focal length	16mm
∞F No.	1.4
Range of WD	300mm ~ ∞
TV distortion	-0.85%
Angle of view (HxV)	44.2°×33.5°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1"
Mount	C

HS2514V

Focal length	25mm
∞F No.	1.4
Range of WD	300mm ~ ∞
TV distortion	-0.02%
Angle of view (HxV)	28.6°×21.6°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1"
Mount	C

HS3516V

Focal length	35mm
∞F No.	1.6
Range of WD	200mm ~ ∞
TV distortion	0.12%
Angle of view (HxV)	22.1°×16.7°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1.1"
Mount	C

HS5016V

Focal length	50mm
∞F No.	1.6
Range of WD	300mm ~ ∞
TV distortion	0.14%
Angle of view (HxV)	16.1°×12.1°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1.1"
Mount	C

HS7520V

Focal length	75mm
∞F No.	2.0
Range of WD	440mm ~ ∞
TV distortion	0.05%
Angle of view (HxV)	11.1°×8.3°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1.1"
Mount	C

HS10028V

Focal length	100mm
∞F No.	2.8
Range of WD	620mm ~ ∞
TV distortion	0.09%
Angle of view (HxV)	8.4°×6.3°
Filter pitch	M46.5 P=0.75
Maximum Compatible sensor	1.1"
Mount	C

* Indicated specifications are design values. * TV distortion indicates a value for minimum working distance.
* Angle of view indicates a value for maximum compatible sensor.



SWIR

1"-1.1"

SWIR Fixed Focal Lens for 1"-1.1"

Possible to capture differences and defects that cannot be seen in visible ray

- Available for SWIR image sensor 1",1.1", InGaAs Sensor
- Special design to transmit SWIR 900 ~ 2000 nm



USB

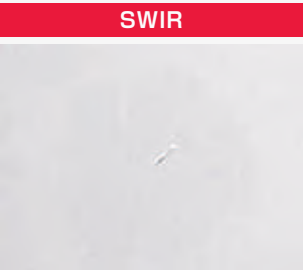
Transmit USB memory stick

PRINTING

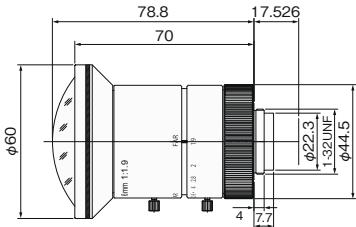
Possible to defect the scratch

Wafer

Possible to defect the back side scratch

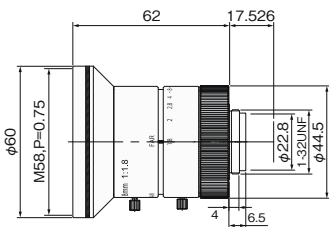


HS0619V-SW



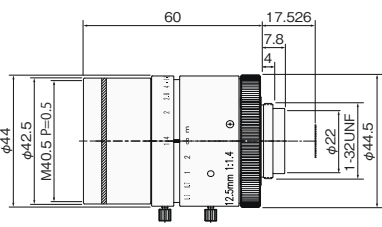
Focal length	6mm
∞F No.	1.9
Range of WD	100mm ~ ∞
TV distortion	0.14%
Angle of view (HxV)	94.1°×77.5°
Maximum Compatible sensor	1"
Mount	C

HS0818V-SW



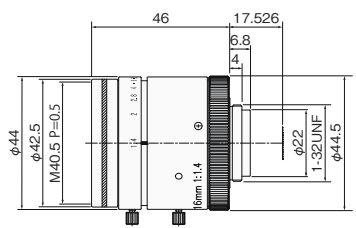
Focal length	8mm
∞F No.	1.8
Range of WD	100mm ~ ∞
TV distortion	-0.52%
Angle of view (HxV)	77°×61°
Filter pitch	M58 P=0.75
Maximum Compatible sensor	1"
Mount	C

HS1214V-SW



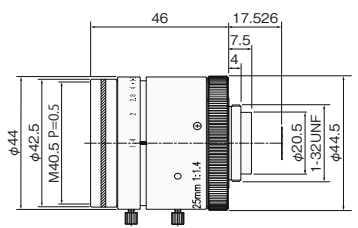
Focal length	12.5mm
∞F No.	1.4
Range of WD	300mm ~ ∞
TV distortion	-1.06%
Angle of view (HxV)	54.2°×41.5°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1"
Mount	C

HS1614V-SW



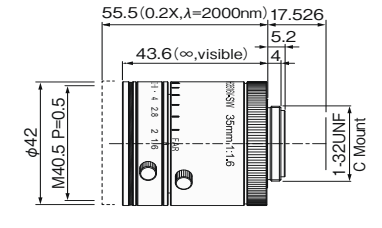
Focal length	16mm
∞F No.	1.4
Range of WD	300mm ~ ∞
TV distortion	-0.97%
Angle of view (HxV)	43.6°×33.1°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1"
Mount	C

HS2514V-SW



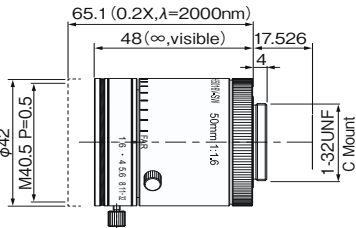
Focal length	25mm
∞F No.	1.4
Range of WD	300mm ~ ∞
TV distortion	-0.01%
Angle of view (HxV)	28.1°×21.3°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1"
Mount	C

HS3516V-SW



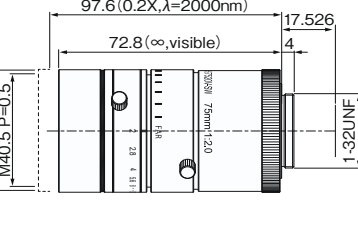
Focal length	35mm
∞F No.	1.6
Range of WD	200mm ~ ∞
TV distortion	0.09%
Angle of view (HxV)	21.5°×16.3°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1.1"
Mount	C

HS5016V-SW



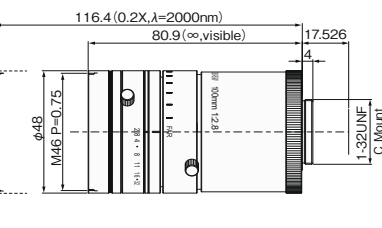
Focal length	50mm
∞F No.	1.6
Range of WD	300mm ~ ∞
TV distortion	0.10%
Angle of view (HxV)	15.8°×11.9°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1.1"
Mount	C

HS7520V-SW



Focal length	75mm
∞F No.	2.0
Range of WD	440mm ~ ∞
TV distortion	0.05%
Angle of view (HxV)	10.8°×8.1°
Filter pitch	M40.5 P=0.5
Maximum Compatible sensor	1.1"
Mount	C

HS10028V-SW



Focal length	100mm
∞F No.	2.8
Range of WD	620mm ~ ∞
TV distortion	0.09%
Angle of view (HxV)	8.2°×6.1°
Filter pitch	M46.5 P=0.75
Maximum Compatible sensor	1.1"
Mount	C

* Indicated specifications are design values. * TV distortion indicates a value for minimum working distance.
* Angle of view indicates a value for maximum compatible sensor.

□□□□□□

3MP

1/2" - 2/3"

Resistance against vibration Lens
for Robot Vision

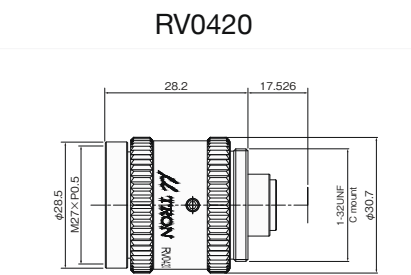
3 Mega Pixel, Low distortion



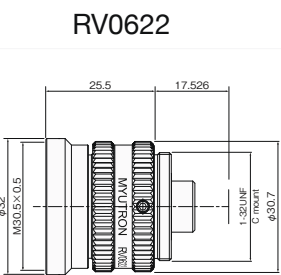
- ❖ Suitable for Resistance against vibration
- ❖ Focus : double nut and set screw
- ❖ Possible to select iris : 2(OPEN) / 4/ 5.6 / 8
- ❖ Compact design
- ❖ 12 kinds of focal length are available

Possible to select iris :
Open / 4 / 5.6 / 8

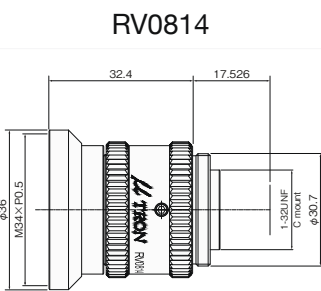
Example Model Name	F NO.
RV0420	F2 (OPEN)
RV0420 – F4	F 4
RV0420 – F5.6	F 5.6
RV0420 – F8	F 8



Application	Resistance against vibration Lens
Focal length	4mm
Closet magnification	0.038x
Operations distance	0.1m - ∞
Effective F No.	2 (OPEN)
TV distortion	0.91%
Angle of view (H x V)	75.24° x 59.96°
Maximum Compatible sensor	1/2
Mount	C



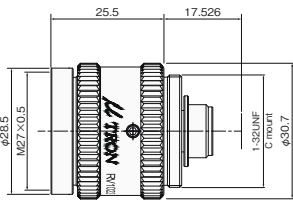
Application	Resistance against vibration Lens
Focal length	6.5mm
Closet magnification	0.055x
Operations distance	0.1m - ∞
Effective F No.	2.2 (OPEN)
TV distortion	-0.01%
Angle of view (H x V)	52.35° x 40.47°
Maximum Compatible sensor	1/2
Mount	C



Application	Resistance against vibration Lens
Focal length	8mm
Closet magnification	0.074x
Operations distance	0.1m - ∞
Effective F No.	1.4 (OPEN)
TV distortion	0.83%
Angle of view (H x V)	56° x 44°
Maximum Compatible sensor	2/3
Mount	C

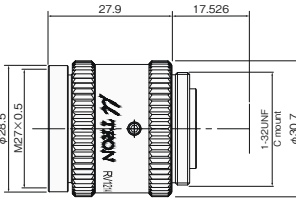
* Indicated specifications are design values. * TV distortion indicates a value for minimum working distance.
* Angle of view indicates a value for maximum compatible sensor.

RV1022



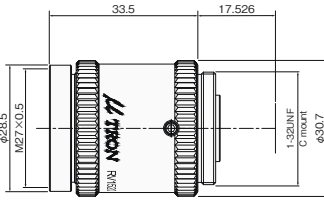
Application	Resistance against vibration Lens
Focal length	10mm
Closet magnification	0.1x
Operations distance	0.1m - ∞
Effective F No.	2.2 (OPEN)
TV distortion	-0.08%
Angle of view (H x V)	34.61° x 26.31°
Maximum Compatible sensor	1/2
Mount	C

RV1214



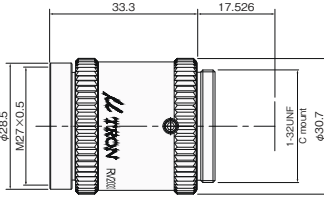
Application	Resistance against vibration Lens
Focal length	12mm
Closet magnification	0.08x
Operations distance	0.15m - ∞
Effective F No.	1.4 (OPEN)
TV distortion	-0.12%
Angle of view (H x V)	39° x 30°
Maximum Compatible sensor	2/3
Mount	C

RV1520



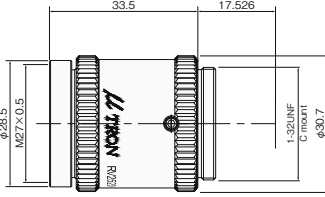
Application	Resistance against vibration Lens
Focal length	15mm
Closet magnification	0.3x
Operations distance	0.05m - ∞
Effective F No.	2 (OPEN)
TV distortion	-0.09%
Angle of view (H x V)	31.79° x 24.11°
Maximum Compatible sensor	2/3
Mount	C

RV2020



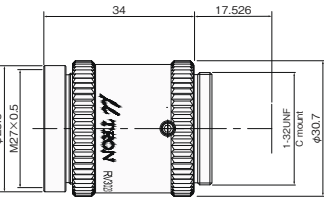
Application	Resistance against vibration Lens
Focal length	20mm
Closet magnification	0.25x
Operations distance	0.09m - 1m
Effective F No.	2 (OPEN)
TV distortion	-0.10%
Angle of view (H x V)	24.11° x 18.2°
Maximum Compatible sensor	2/3
Mount	C

RV2520



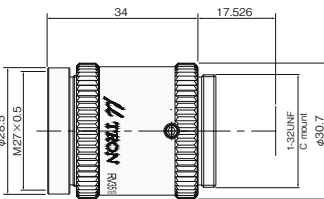
Application	Resistance against vibration Lens
Focal length	25mm
Closet magnification	0.2x
Operations distance	0.15m - 1m
Effective F No.	2 (OPEN)
TV distortion	-0.01%
Angle of view (H x V)	19.58° x 14.75°
Maximum Compatible sensor	2/3
Mount	C

RV3020



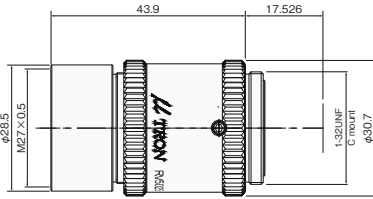
Application	Resistance against vibration Lens
Focal length	30mm
Closet magnification	0.16x
Operations distance	0.2m - 1m
Effective F No.	2 (OPEN)
TV distortion	-0.02%
Angle of view (H x V)	16.69° x 12.55°
Maximum Compatible sensor	2/3
Mount	C

RV3519



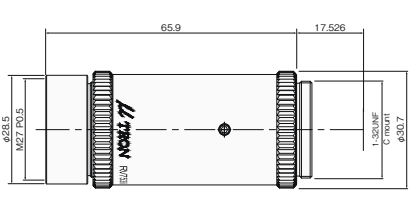
Application	Resistance against vibration Lens
Focal length	35mm
Closet magnification	0.13x
Operations distance	0.3m - 1m
Effective F No.	1.9 (OPEN)
TV distortion	-0.03%
Angle of view (H x V)	14.32° x 10.77°
Maximum Compatible sensor	2/3
Mount	C

RV5025



Application	Resistance against vibration Lens
Focal length	50mm
Closet magnification	0.13x
Operations distance	0.4m - 1m
Effective F No.	2.5 (OPEN)
TV distortion	0.03%
Angle of view (H x V)	10.38° x 7.82°
Maximum Compatible sensor	2/3
Mount	C

RV7538



Application	Resistance against vibration Lens
Focal length	75mm
Closet magnification	0.2x
Operations distance	0.4m - 1m
Effective F No.	3.8 (OPEN)
TV distortion	-0.01%
Angle of view (H x V)	6.81° x 5.11°
Maximum Compatible sensor	2/3
Mount	C

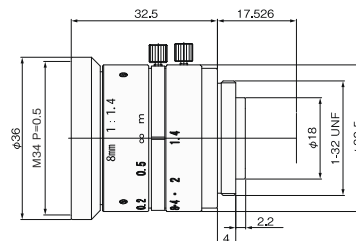
* Indicated specifications are design values. * TV distortion indicates a value for minimum working distance.
* Angle of view indicates a value for maximum compatible sensor.



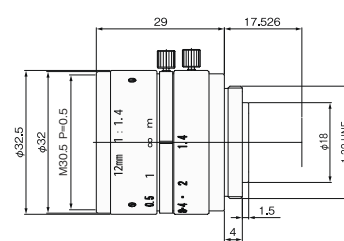
1/1.8"- 2/3"

Excellent brightness, Low distortion, and suitable for various applications

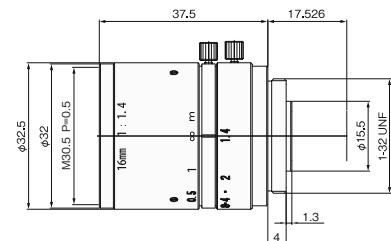
- HS0420H and HS0618H are designed for low distortion
 - Stable performance from macro to infinity (∞)
 - Suitable for 3 Mega Pixel (1/1.8", 2/3")
 - High durability
- 



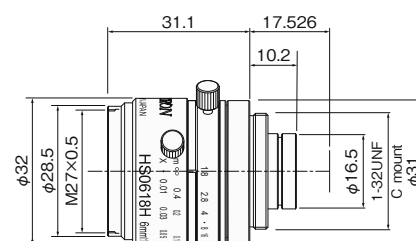
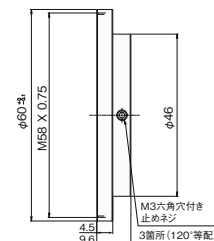
Focal length	8mm
∞F No.	1.4
Range of WD	100mm - ∞
TV distortion	0.83%
Angle of view (HxV)	56° × 44°
Filter pitch	M34 P=0.5
Maximum Compatible sensor	2/3



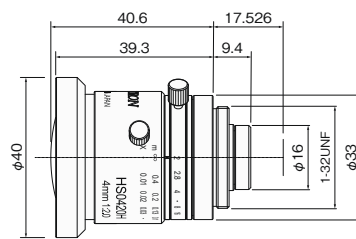
Focal length	12mm
∞ F No.	1.4
Range of WD	150mm - ∞
TV distortion	-0.12%
Angle of view (HxV)	39° x 30°
Filter pitch	M30.5 P=0.5
Maximum Compatible sensor	2/3



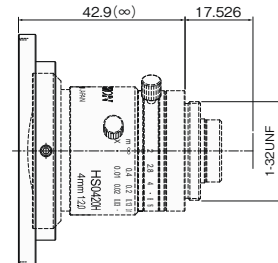
Focal length	16mm
∞F No.	1.4
Range of WD	200mm - ∞
TV distortion	-0.14%
Angle of view (HxV)	30° × 23°
Filter pitch	M30.5 P=0.5
Maximum Compatible sensor	2/3



Focal length	6mm
∞ F No.	1.8
Range of WD	100mm $\sim \infty$
TV distortion	-0.13%
Angle of view (HxV)	61° x 47°
Filter pitch	M27 P=0.5
Maximum Compatible sensor	1/1.8"

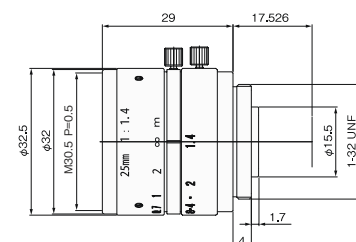


Focal length	4mm
∞ F No.	2.0
Range of WD	100mm $\sim \infty$
TV distortion	0.26%

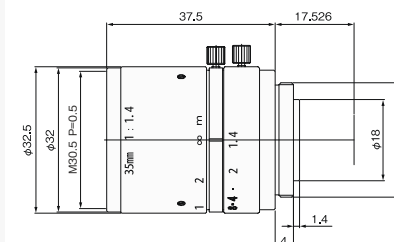


Angle of view (HxV)	85°x68°
Filter pitch	M58 P=0.75 (OPTION)
Maximum Compatible sensor	1/1.8"

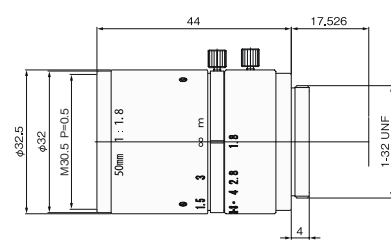
* Indicated specifications are design values. * TV distortion indicates a value for minimum working distance.
* Angle of view indicates a value for maximum compatible sensor.



Focal length	25mm
∞F No.	1.4
Range of WD	300mm - ∞
TV distortion	-0.12%
Angle of view (HxV)	19° × 15°
Filter pitch	M30.5 P=0.5
Maximum Compatible sensor	2/3



Focal length	35mm
∞ F No.	1.4
Range of WD	300mm - ∞
TV distortion	-0.06%
Angle of view (HxV)	14° × 11°
Filter pitch	M30.5 P=0.5
Maximum Compatible sensor	2/3



Focal length	50mm
∞F No.	1.8
Range of WD	500mm - ∞
TV distortion	0.07%
Angle of view (H×V)	10° × 7.7°
Filter pitch	M30.5 P=0.5
Maximum Compatible sensor	2/3

* Indicated specifications are design values. * TV distortion indicates a value for minimum working distance.
* Angle of view indicates a value for maximum compatible sensor.



Design for low distortion

- ion,
D, less than 500mm
d with
t for f4mm)
without
- 

* Indicated specifications are design values. * Angle of view indicates a value for maximum compatible sensor.
* TV distortion indicates a value for the minimum working distance.

Focal length	10mm	Angle of view(HxV)	34.61°× 26.31°
∞F No.	2.2	Filter pitch	M27 P=0.5
Range of WD	0.1m - ∞	Maximum Compatible sensor	1/2
TV distortion	-0.08%		

Focal length	20mm	Angle of view(HxV)	24.11°×18.2°
∞F No.	2.0	Filter pitch	M27 P=0.5
Range of WD	0.1m - 1m	Maximum Compatible sensor	2/3
TV distortion	-0.10%		

Focal length	30mm	Angle of view(HxV)	16.69°x12.55°
∞F No.	2.0	Filter pitch	M27 P=0.5
Range of WD	0.2m - 1m	Maximum Compatible sensor	2/3
TV distortion	-0.02%		

Focal length	50mm	Angle of view(HxV)	6.5° x 4.9°
∞F No.	2.5	Filter pitch	M27 P=0.5
Range of WD	0.4m - 1m	Maximum Compatible sensor	2/3
TV distortion	0.03%		

* Indicated specifications are design values. * Angle of view indicates a value for maximum compatible sensor.
* TV distortion indicates a value for the minimum working distance.

Focal length	15mm	Angle of view(HxV)	31.79°x 24.11°
∞F No.	2.0	Filter pitch	M27 P=0.5
Range of WD	0.1 m - ∞	Maximum Compatible sensor	2/3
TV distortion	-0.09%		

Focal length	25mm	Angle of view(HxV)	19.58°×14.75°
∞F No.	2.0	Filter pitch	M27 P=0.5
Range of WD	0.15m - 1m	Maximum Compatible sensor	2/3
TV distortion	-0.01%		

Focal length	35mm	Angle of view(HxV)	14.32°x10.77°
∞F No.	1.9	Filter pitch	M27 P=0.5
Range of WD	0.3m - 1m	Maximum Compatible sensor	2/3
TV distortion	-0.03%		

Focal length	75mm	Angle of view(HxV)	6.81°× 5.11°
∞F No.	3.8	Filter pitch	M27 P=0.5
Range of WD	0.4m - 1m	Maximum Compatible sensor	2/3
TV distortion	-0.01%		



1/2" - 2/3"

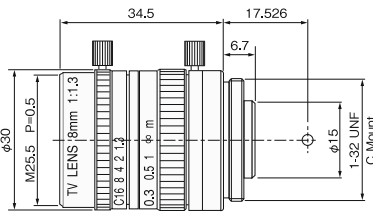
VGA Fixed Focal Lens

Wide range of focal length is available Suitable for various applications

- Focal length f3.5mm - f100mm, 10 models are available
- Available for focus and iris lock screws
- Suitable for various applications

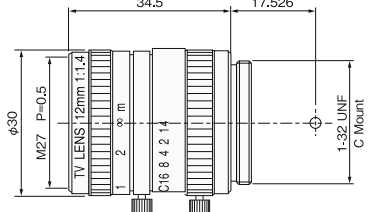


MV0813



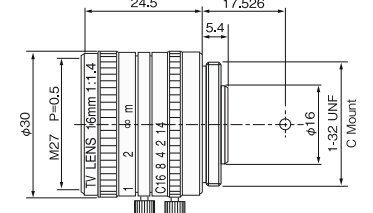
Focal length	8.0mm	Angle of view(HxV)	57.8°×45°
∞F No.	1.3	Filter pitch	M25.5 P=0.5
Range of WD	0.2m - ∞	Maximum Compatible sensor	2/3

MV1214



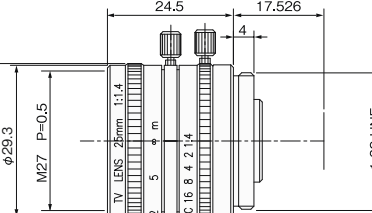
Focal length	12mm	Angle of view(HxV)	29°×21.9°
∞F No.	1.4	Filter pitch	M27 P=0.5
Range of WD	0.3m - ∞	Maximum Compatible sensor	1/2

MV1614



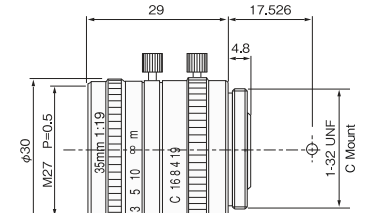
Focal length	16mm	Angle of view(HxV)	30.4°×23°
∞F No.	1.4	Filter pitch	M27 P=0.5
Range of WD	0.4m - ∞	Maximum Compatible sensor	2/3

MV2514



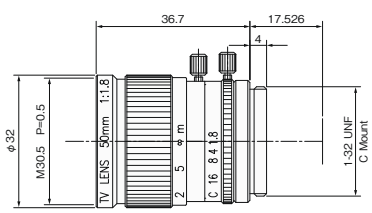
Focal length	25mm	Angle of view(HxV)	28.5°×21.6°
∞F No.	1.4	Filter pitch	M27 P=0.5
Range of WD	0.5m - ∞	Maximum Compatible sensor	2/3

MV3519



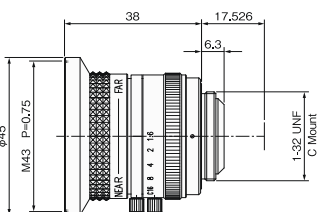
Focal length	35mm	Angle of view(HxV)	14.4°×10.8°
∞F No.	1.9	Filter pitch	M27 P=0.5
Range of WD	0.5m - ∞	Maximum Compatible sensor	2/3

MV5018



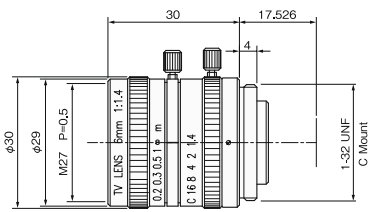
Focal length	50mm	Angle of view(HxV)	10.5°×7.9°
∞F No.	1.8	Filter pitch	M30.5 P=0.5
Range of WD	1m - ∞	Maximum Compatible sensor	2/3

MV0316



Focal length	3.5mm	Angle of view(HxV)	84.9°×68.9°
∞F No.	1.6	Filter pitch	M43 P=0.75
Range of WD	0.1m - ∞	Maximum Compatible sensor	1/2

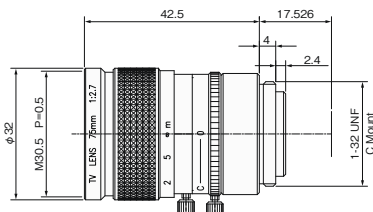
MV0614



Focal length	6.0mm	Angle of view(HxV)	54.6°×42.3°
∞F No.	1.4	Filter pitch	M27 P=0.5
Range of WD	0.2m - ∞	Maximum Compatible sensor	1/2

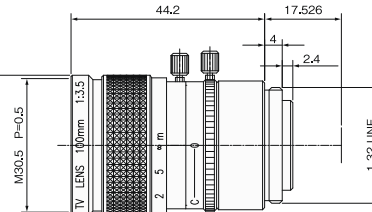
* Indicated specifications are design values. * Angle of view indicates a value for maximum compatible sensor.

MV7527



Focal length	75mm	Angle of view(HxV)	6.5°×4.9°
∞F No.	2.7	Filter pitch	M30.5 P=0.5
Range of WD	1m - ∞	Maximum Compatible sensor	2/3

MV10035



Focal length	100mm	Angle of view(HxV)	5.1°×3.8°
∞F No.	3.5	Filter pitch	M30.5 P=0.5
Range of WD	1m - ∞	Maximum Compatible sensor	2/3

* Indicated specifications are design values. * Angle of view indicates a value for maximum compatible sensor.

ACCESSORIES



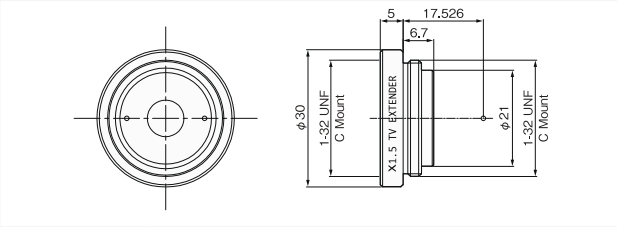
Rear Converter

Rear converter for C mount

- Easy to convert magnification without changing the working distance
- * Using rear converter is deteriorated resolution and F No.

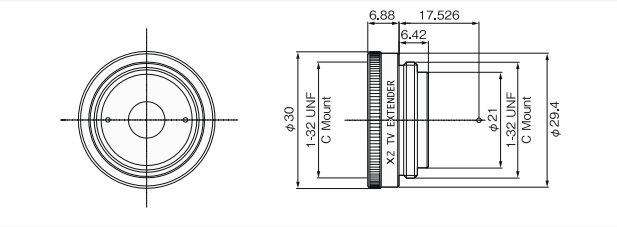


RC15



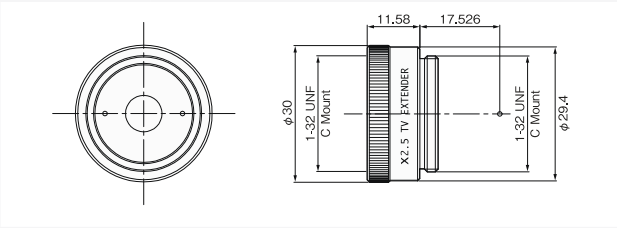
Magnification 1.5x

RC20



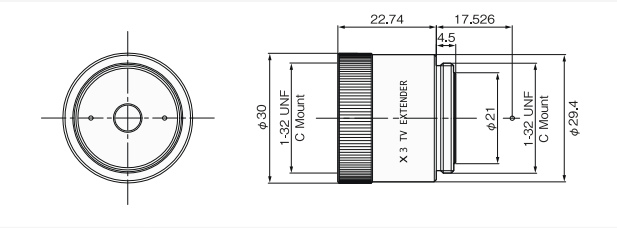
Magnification 2.0x

RC25



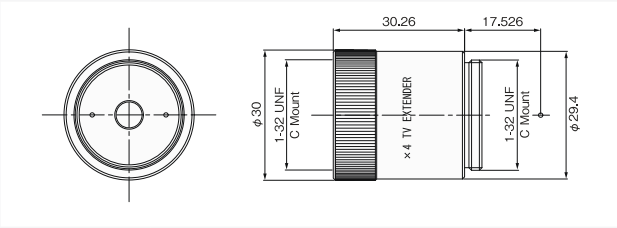
Magnification 2.5x

RC30



Magnification 3.0x

RC40



Magnification 4.0x

Extension Ring

Fixed Focal lens can be changed into macro lens with extension rings

- Attach to the end of a lens to change magnification and WD

Model	Specification
SR-02	0.2mm
SR-05	0.5mm
SR-1	1mm
SR-2	2mm
SR-5	5mm
SR-10	10mm
SR-15	15mm
SR-20	20mm
SR-30	30mm
SR-40	40mm
SR-50	50mm
SR-100	100mm
SR-SET	0.5mm, 1mm, 2mm, 5mm, 10mm, 20mm, 40mm

Magnification, WD and FOV Chart for Extension Ring
Fixed Focal Lens (MV Series)

Extension Ring (mm)	MV0316				MV0614				MV0813				MV1214				MV1614			
	FOV (V x H)	WD (mm)	magnification		FOV (V x H)	WD (mm)	magnification		FOV (V x H)	WD (mm)	magnification		FOV (V x H)	WD (mm)	magnification		FOV (V x H)	WD (mm)	magnification	
0	147x196	110x147	100	0.03	165x221	124x165	200	0.03	96x128	72x96	148	0.05	103x137	77x103	248	0.05	109x145	82x109	358	0.04
0.5	28x37	21x28	10	0.17	44x58	33x44	43	0.11	43x57	32x43	59	0.11	55x73	41x55	125	0.09	64x86	48x64	206	0.07
1	35x46	26x35	14	0.14	60x79	45x60	63	0.08	77x102	57x77	115	0.06	119x159	89x119	289	0.04	156x208	117x156	515	0.03
1.5					25x34	19x25	19	0.19	27x37	21x27	34	0.18	38x50	28x38	80	0.13	45x61	34x45	143	0.11
2					30x40	22x30	25	0.16	38x51	29x38	52	0.13	59x79	45x59	136	0.08	78x104	58x78	252	0.06
5									20x27	15x20	22	0.24	29x38	21x29	57	0.17	35x47	26x35	108	0.14
10									26x34	19x26	31	0.19	40x53	30x40	85	0.12	52x69	39x52	164	0.09
													23x31	17x23	42	0.21	29x38	22x29	86	0.17
													30x40	22x30	59	0.16	39x52	29x39	120	0.12
																	14x18	10x14	35	0.35
																	16x21	12x16	42	0.31
																	7.3x9.7	5.4x7.3	14	0.66
																	7.8x10	5.8x7.8	15	0.62

Extension Ring (mm)	MV2514				MV3519				MV5018				MV7527				MV10035			
	FOV (V x H)	WD (mm)	magnification		FOV (V x H)	WD (mm)	magnification		FOV (V x H)	WD (mm)	magnification		FOV (V x H)	WD (mm)	magnification		FOV (V x H)	WD (mm)	magnification	
0	87x115	65x87	458	0.06	66x87	49x66	500	0.07	90x120	68x90	943	0.05	60x80	45x60	1000	0.08	46x62	35x46	1000	0.1
0.5	64x85	48x64	338	0.08	55x73	41x55	422	0.09												
1	242x322	181x242	1270	0.02	335x447	251x335	2459	0.01												
1.5	50x67	38x50	269	0.1	47x63	35x47	366	0.1												
2	121x161	91x121	637	0.04	168x223	126x168	1240	0.03												
5	42x56	31x42	223	0.12	41x55	31x41	324	0.12	57x76	43x57	610	0.08								
10	81x107	60x81	425	0.06	112x149	84x112	834	0.04	154x205	115x154	1577	0.03								
15	36x47	27x36	191	0.13	37x49	28x37	291	0.13	51x67	38x51	548	0.1	43x57	32x43	776	0.11				
20	60x81	45x60	320	0.08	84x112	63x84	631	0.06	115x154	86x115	1193	0.04	184x246	138x184	3189	0.03				
25	19x25	14x19	103	0.25	22x30	17x22	185	0.22	31x41	23x31	347	0.16	30x40	23x30	607	0.16	27x37	21x27	724	0.18
30	24x32	18x24	130	0.2	34x45	25x34	265	0.14	46x61	35x46	503	0.1	74x98	55x74	1422	0.07	95x127	71x95	2413	0.05
35	11x14	8.0x11	60	0.45	13x18	10x13	121	0.36	18x25	14x18	226	0.26	20x27	15x20	475	0.24	19x26	15x19	609	0.25
40	12x16	9.1x12	66	0.4	17x22	13x17	143	0.29	23x31	17x23	273	0.21	37x49	28x37	833	0.13	48x63	36x48	1432	0.1
45	7.4x9.8	5.5x7.4	43	0.65	9.5x13	7.2x9.5	93	0.5	13x18	10x13	174	0.37	15x20	11x15	408	0.32	15x20	11x15	546	0.32
50	8.1x11	6.0x8.1	45	0.6	11x15	8.4x11	103	0.43	15x21	12x15	196	0.31	25x33	18x25	636	0.2	32x42	24x32	1105	0.15
	5.6x7.5	4.2x5.6	34	0.85	7.4x9.9	5.6x7.4	78	0.65	10x14	7.7x10	145	0.47	12x16	9x12	369	0.4	12x16	9x12	505	0.39
	6.0x8.1	4.5x6.0	35	0.79	8.4x11	6.3x8.4	82	0.57	12x15	8.6x12	158	0.42	18x25	14x18	538	0.26	24x32	18x24	941	0.2
					6.1x8.1	4.6x6.1	68	0.79	8.4x11	6.3x8.4	126	0.57	10x14	7.6x10	342	0.47	10x14	8x10	478	0.46
									9.2x12	6.9x9.2	134	0.52	15x20	11x15	479	0.33	19x25	14x19	843	0.25
					6.7x8.9	5.0x6.7	70	0.72												
									7.1x9.4	5.3x7.1	113	0.68	8.7x12	6.5x8.7	323	0.55	9.0x12	6.7x9.0	458	0.54
									7.7x10	5.8x7.7	119	0.63	12x16	9.2x12	440	0.39	16x21	12x16	778	0.3
									6.1x8.2	4.6x6.1	104	0.78	7.6x10	5.7x7.6	309	0.63	7.9x11	5.9x7.9	443	0.61
									6.6x8.8	4.9x6.6	108	0.73	11x14	7.9x11	412	0.46	14x18	10x14	731	0.35
									5.4x7.2	4.1x5.4	97	0.89	6.7x9.0	5.1x6.7	297	0.71	7.1x9.4	5.3x7.1	430	0.68
									5.8x7.7	4.3x5.8	100	0.83	9.2x12	6.9x9.2	391	0.52	12x16	8.9x12	696	0.4
																	6.1x8.1	4.6x6.1	289	0.79
																	8.2x11	6.1x8.2	375	0.59
																	5.5x7.4	4.1x5.5	281	0.87
																	7.4x9.8	5.5x7.4	361	0.65
																	9.5x13	7.1x9.5	647	0.5

Magnification, WD and FOV Chart for Extension Ring
Mega Pixel Low Distortion Fixed Focal Lens (FV Series)

Extension Ring (mm)	FV0420				FV0622				FV1022				FV1520			
	FOV (V x H)		WD (mm)	magnification	FOV (V x H)		WD (mm)	magnification	FOV (V x H)		WD (mm)	magnification	FOV (V x H)		WD (mm)	magnification
	1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD		
0	126×168	95×126	97	0.038	86×114	64×86	97	0.056	49×65	37×49	91	0.098	33×44	24×33	92	0.147
0.5	30×41	23×30	14	0.158	36×48	27×36	30	0.132	33×44	25×33	56	0.146	27×36	20×27	73	0.179
1	40×53	30×40	23	0.120	62×83	47×62	65	0.077	98×131	73×98	196	0.049	150×200	113×150	462	0.032
1.5	17×23	13×17	3	0.279	23×31	17×23	12	0.209	25×33	18×25	38	0.195	23×30	17×23	60	0.212
2	20×27	15×20	6	0.240	31×42	23×31	23	0.154	49×66	37×49	90	0.097	74×98	55×74	223	0.065
5					17×22	13×17	4	0.286	20×26	15×20	28	0.244	20×26	15×20	50	0.244
10					21×28	16×21	9	0.230	33×44	25×33	55	0.146	49×66	37×49	144	0.097
									16×22	12×16	21	0.292	17×23	13×17	43	0.276
									25×33	18×25	38	0.195	37×50	28×37	104	0.129
									8.2×11	6.2×8.2	3	0.585	10×14	7.7×10	20	0.470
									9.9×13	7.4×9.9	6	0.487	15×20	11×15	32	0.324
													6.0×8.1	4.5×6.0	6	0.794
													7.4×9.9	5.6×7.4	8	0.647

Extension Ring (mm)	FV2020				FV2520				FV3020				FV3519			
	FOV (V x H)		WD (mm)	magnification	FOV (V x H)		WD (mm)	magnification	FOV (V x H)		WD (mm)	magnification	FOV (V x H)		WD (mm)	magnification
	1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD		
0	22×29	17×22	88	0.217	27×35	20×27	142	0.181	29×39	22×29	190	0.164	37×49	27×37	288	0.131
0.5	229×305	171×229	984	0.021	185×246	138×185	988	0.026	155×206	116×155	986	0.031	133×178	100×133	985	0.036
1	20×27	15×20	79	0.241	24×32	18×24	128	0.200	27×35	20×27	173	0.181	33×44	25×33	262	0.145
1.5	107×142	80×107	447	0.045	107×142	80×107	559	0.045	102×136	77×102	639	0.047	96×128	72×96	711	0.050
2	18×24	14×18	71	0.265	22×29	16×22	117	0.220	24×32	18×24	159	0.198	30×40	23×30	241	0.159
5	70×93	52×70	287	0.069	74×98	55×74	390	0.065	75×100	56×75	473	0.064	74×98	55×74	558	0.065
10	17×22	12×17	64	0.290	20×27	15×20	107	0.240	22×30	17×22	148	0.214	28×37	21×28	222	0.174
15	51×68	38×51	209	0.094	56×75	42×56	299	0.085	59×79	44×59	376	0.081	61×81	46×61	461	0.079
20	15×20	11×15	59	0.314	19×25	14×19	99	0.259	21×28	16×21	137	0.231	26×34	19×26	207	0.188
25	41×54	31×41	164	0.118	46×62	35×46	242	0.104	49×66	37×49	312	0.097	52×69	39×52	393	0.093
	10×14	7.8×10	38	0.459	13×17	9.5×13	69	0.377	15×19	11×15	98	0.331	18×23	13×18	149	0.273
	18×24	14×18	67	0.263	22×29	16.2×22	112	0.222	24×32	18×24	156	0.197	27×36	20×27	213	0.179
	6.8×9.1	5.1×6.8	22	0.702	8.4×11	6.3×8.4	45	0.573	9.6×13	7.2×9.6	68	0.498	12×15	9×12	105	0.416
	9.5×13	7.1×9.5	30	0.506	11×15	8.6×11	58	0.418	13×18	9.9×13	86	0.364	15×20	11×15	126	0.322
	5.1×6.8	3.8×5.1	15	0.945	6.2×8.3	4.7×6.2	34	0.769	7.2×9.6	5.4×7.2	53	0.664	8.6×11	6.4×8.6	83	0.559
	6.4×8.5	4.8×6.4	17	0.749	7.8×10	5.9×7.8	39	0.614	9.0×12	6.8×9.0	60	0.531	10×14	7.7×10	93	0.465
					5.0×6.6	3.7×5.0	27	0.965	5.8×7.7	4.3×5.8	44	0.831	6.8×9.1	5.1×6.8	71	0.702
					5.9×7.9	4.4×5.9	28	0.810	6.9×9.2	5.2×6.9	47	0.697	7.9×11	5.9×7.9	75	0.607
													5.7×7.6	4.3×5.7	62	0.845
													6.4×8.5	4.8×6.4	64	0.750

Extension Ring (mm)	FV5025				FV7538			
	FOV (V x H)		WD (mm)	magnification	FOV (V x H)		WD (mm)	magnification
	1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD		
0	37×50	28×37	397	0.129	24×31	18×24	398	0.204
0.5	96×128	72×96	993	0.050	62×83	47×62	988	0.077
1	35×46	26×35	370	0.139	23×30	17×23	386	0.211
1.5	80×107	60×80	826	0.060	57×76	43×57	910	0.084
2	32×43	24×32	345	0.150	22×29	17×22	375	0.218
5	69×91	51×69	707	0.070	53×71	40×53	844	0.090
10	30×40	23×30	324	0.160	21×28	16×21	364	0.225
15	59×79	44×59	619	0.081	49×66	37×49	787	0.097
20	28×38	21×28	306	0.170	21×28	16×21	356	0.231
25	53×70	40×53	551	0.091	46×62	35×46	738	0.104
30	21×28	16×21	230	0.232	18×24	13×18	307	0.272
35	31×42	24×31	335	0.153	33×44	25×33	538	0.144
40	14×19	11×14	166	0.335	14×19	11×14	253	0.340
45	19×25	14×19	207	0.256	23×30	17×23	375	0.212
50	11×15	8.2×11	132	0.438	12×16	8.8×12	217	0.407
	13×18	10×13	153	0.359	17×23	13×17	290	0.280
	8.9×12	6.6×8.9	111	0.542	10×13	7.6×10	191	0.475
	10×14	7.8×10	122	0.462	14×18	10×14	239	0.347
	7.4×9.9	5.6×7.4	97	0.645	8.9×12	6.6×8.9	172	0.542
	8.5×11	6.4×8.5	103	0.566	12×15	8.7×12	204	0.415
	6.4×8.6	4.8×6.4	86	0.748	7.9×10	5.9×7.9	157	0.610
	7.2×9.6	5.4×7.2	90	0.669	10×13	7.5×10	179	0.482
	5.6×7.5	4.2×5.6	78	0.851	7.1×9.5	5.3×7.1	145	0.677
	6.2×8.3	4.7×6.2	80	0.772	8.7×12	6.5×8.7	160	0.550
	5.0×6.7	3.8×5.0	72	0.954	6.4×8.6	4.8×6.4	135	0.745
	5.5×7.3	4.1×5.5	73	0.875	7.8×10	5.8×7.8	146	0.618
					5.9×7.9	4.4×5.9	126	0.813
					7.0×9.3	5.3×7.0	134	0.685
					5.5×7.3	4.1×5.5	119	0.880
					6.4×8.5	4.8×6.4	124	0.753

WD and FOV Chart for Extension Ring
3 Mega Pixel Fixed Focal Lens (HS Series)

Extension Ring (mm)	HS0814J				HS1214J				HS1614J			
	FOV (V x H)		WD (mm)	Magnification	FOV (V x H)		WD (mm)	Magnification	FOV (V x H)		WD (mm)	Magnification
	1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD		
0	65×86	49×65	90	0.074	61×81	46×61	145	0.079	60 x 80	45 x 60	197	0.08
0.5	600×800	450×600	989	0.008	400×533	300×400	994	0.012	300 x 400	225 x 300	996	0.016
1	36×47	27×36	40	0.135	40×54	30×40	92	0.119	44 x 58	33 x 44	141	0.11
1.5	70×93	52×70	98	0.069	91×121	68×91	223	0.053	102 x 136	77 x 102	343	0.047
2	24×33	18×24	21	0.196	30×40	23×30	65	0.16	34 x 45	26 x 34	108	0.141
5	37×49	28×37	42	0.13	52×69	39×52	120	0.093	62 x 83	47 x 62	204	0.077
10	19×25	14×19	11	0.256	24×32	18×24	50	0.2	28 x 37	21 x 28	87	0.171
15	25×34	19×25	21	0.19	36×48	27×36	80	0.133	45 x 60	34 x 45	144	0.107
20	15×20	11×15	5	0.317	20×27	15×20	39	0.24	24 x 32	18 x 24	73	0.201
25	19×25	14×19	11	0.251	28×37	21×28	58	0.173	35 x 46	26 x 35	110	0.138
					10×13	7.5×10	13	0.482	13 x 17	9.4 x 13	34	0.383
					12×15	8.7×12	17	0.415	15 x 20	11 x 15	42	0.32
					5.4×7.2	4.1×5.4	2	0.885	7 x 9.3	5.2 x 7	15	0.686
					5.9×7.8	4.4×5.9	2	0.818	7.7 x 10	5.8 x 7.7	16	0.623

Extension Ring (mm)	HS2514J				HS3514J				HS5018J			
	FOV (V x H)		WD (mm)	Magnification	FOV (V x H)		WD (mm)	Magnification	FOV (V x H)		WD (mm)	Magnification
	1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD			1/2 CCD	1/3 CCD		
0	55 x 74	41 x 55	291	0.087	47 x 63	35 x 47	337	0.102	43 x 58	32 x 43	438	0.111
	185 x 246	138 x 185	988	0.026	98 x 131	73 x 98	701	0.049	80 x 107	60 x 80	813	0.06
0.5	45 x 60	34 x 45	236	0.107	41 x 55	31 x 41	295	0.116	40 x 53	30 x 40	402	0.121
	107 x 142	80 x 107	560	0.045	75 x 100	56 x 75	542	0.064	69 x 91	51 x 69	693	0.07
1	38 x 51	29 x 38	200	0.126	37 x 49	28 x 37	263	0.13	37 x 49	27 x 37	371	0.131
	74 x 98	55 x 74	390	0.065	62 x 82	46 x 62	441	0.078	60 x 80	45 x 60	604	0.08
1.5	33 x 44	25 x 33	172	0.146	33 x 44	25 x 33	235	0.145	34 x 45	26 x 34	345	0.141
	57 x 76	43 x 57	298	0.084	52 x 70	39 x 52	371	0.092	53 x 70	40 x 53	536	0.091
2	29 x 39	22 x 29	151	0.166	21 x 28	16 x 21	145	0.231	24 x 32	18 x 24	239	0.203
	46 x 62	35 x 46	241	0.104	27 x 36	20 x 27	188	0.178	32 x 42	24 x 32	317	0.152
5	17 x 23	13 x 17	87	0.283	13 x 17	10 x 13	87	0.374	16 x 21	12 x 16	159	0.305
	22 x 29	16 x 22	111	0.221	15 x 20	11 x 15	101	0.321	19 x 25	14 x 19	188	0.254
10	10 x 13	7.5 x 10	50	0.479	9.3 x 12	7 x 9.3	62	0.517	12 x 16	9 x 12	118	0.408
	12 x 15	8.6 x 12	57	0.417	10 x 14	7.8 x 10	67	0.464	13 x 18	10 x 13	133	0.357
15	7.1 x 9.5	5.3 x 7.1	35	0.674	7.3 x 10	5.5 x 7.3	47	0.66	9 x 13	7.1 x 9.4	95	0.51
	7.8 x 10	5.9 x 7.8	37	0.613	7.9 x 11	5.9 x 7.9	50	0.607	10 x 14	7.8 x 10	103	0.459
20	5.5 x 7.4	4.1 x 5.5	26	0.87	6 x 8	4.5 x 6	37	0.803	7.8 x 10.4	5.9 x 7.8	78	0.613
	5.9 x 7.9	4.5 x 5.9	27	0.808	6.4 x 8.5	4.8 x 6.4	39	0.75	8.5 x 11.4	6.4 x 8.5	83	0.562
30									6.7 x 9	5 x 6.7	67	0.715
									7.2 x 9.6	5.4 x 7.2	70	0.664
35									5.9 x 7.8	4.4 x 5.9	59	0.818
									6.3 x 8.3	4.7 x 6.3	60	0.767

Filter

Customization is available

▶ Attach to the tip of lenses and use for adjustment of wavelength and brightness

*Please contact us for different filters, not listed on the catalog.



UV Cut Filter (Protection cover filter)		
Model	Filter	Screw Pitch
UV225	UV-CUT	M22.5 P=0.5
UV255	UV-CUT	M25.5 P=0.5
UV270	UV-CUT	M27.0 P=0.5
UV305	UV-CUT	M30.5 P=0.5



IR Cut Filter		
Model	Filter	Screw Pitch
IR225	IR-CUT	M22.5 P=0.5
IR255	IR-CUT	M25.5 P=0.5
IR270	IR-CUT	M27.0 P=0.5
IR305	IR-CUT	M30.5 P=0.5



ND Filter		
Model	Filter	Screw Pitch
ND2225	ND 2 (50%)	M22.5 P=0.5
ND2255	ND 2 (50%)	M25.5 P=0.5
ND2270	ND 2 (50%)	M27.0 P=0.5
ND2305	ND 2 (50%)	M30.5 P=0.5
ND2405	ND 2 (50%)	M40.5 P=0.5
ND4225	ND 4 (25%)	M22.5 P=0.5
ND4255	ND4(25%)	M25.5 P=0.5
ND4270	ND4(25%)	M27.0 P=0.5
ND4305	ND4(25%)	M30.5 P=0.5
ND4405	ND4(25%)	M40.5 P=0.5
ND8270	ND8(12.5%)	M27.0 P=0.5
ND8305	ND8(12.5%)	M30.5 P=0.5



Polarized Filter		
Model	Filter	Screw Pitch
PL255R	Rotation type LIGHTING	M25.5 P=0.5
PL270R		M27.0 P=0.5
PL305R		M30.5 P=0.5
PL340R		M34.0 P=0.5
PL355R		M35.5 P=0.5
PL375R		M37.5 P=0.5
PL405R		M40.5 P=0.5
PL430R		M43.0 P=0.75
PL460R		M46.0 P=0.75
PL490R		M49.0 P=0.75
PL520R		M52.0 P=0.75
PL550R		M55.0 P=0.75
PL580R		M58.0 P=0.75
PL620R		M62.0 P=0.75
PL670R		M67.0 P=0.75
PL720R		M72.0 P=0.75
PL770R		M77.0 P=0.75
PL820R		M82.0 P=0.75
PL950R		M95.0 P=0.75



Color Fiter					
Model	Filter	Screw Pitch	Model	Filter	Screw Pitch
B225	Blue	M22.5 P=0.5	Y225	Yellow	M22.5 P=0.5
B255	Blue	M25.5 P=0.5	Y255	Yellow	M25.5 P=0.5
B270	Blue	M27.0 P=0.5	Y270	Yellow	M27.0 P=0.5
B305	Blue	M30.5 P=0.5	Y305	Yellow	M30.5 P=0.5
G225	Green	M22.5 P=0.5	R225	Red	M22.5 P=0.5
G255	Green	M25.5 P=0.5	R255	Red	M25.5 P=0.5
G270	Green	M27.0 P=0.5	R270	Red	M27.0 P=0.5
G305	Green	M30.5 P=0.5	R305	Red	M30.5 P=0.5

CHART

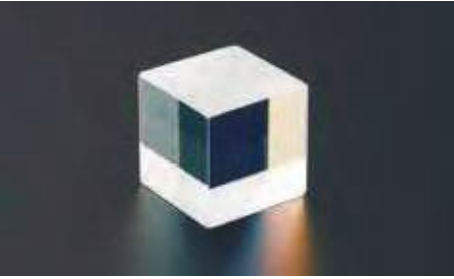
Screw Pitch	Model Name			
	LINE / LARGE AREA SENSOR LENS	TELECENTRIC LENS	MACRO ZOOM LENS	FIXED FOCAL LENS
M25.5 P=0.5				MV0813
M27.0 P=0.5			CMZ0540-2	RV0420,RV1022,RV1214,RV1520,RV2020,RV2520,RV3020,RV3519,RV5025,RV7538,HS0618H,FV0420,FV1022,FV1520,FV2020,FV2520,FV3020,FV3519,FV5025,FV7538,MV1214,MV1614,MV2514,MV3519
M30.5 P=0.5		VTL0513	HMZ0745, HMZ0745C	RV0622,HS1214J,HS1614J,HS2514J,HS3514J,HS5018J,MV0316,FV0622,MV5018,MV7527,MV10035
M34 P=0.75		FTV30-110,FTV30C-110,FTV40-110,FTV40C-110,FTV60-110,FTV60C-110,FTV30C-110SW,FTV40C-110SW,MGTL10V,MGTL10VC,TL07C-340,TL10C-310,		RV0814,HS0814J
M35.5 P=0.5		VTL0714V, MGTL05VM, MGTL05VMC, MGTL069VM, MGTL069VMC		
M37.5 P=0.5	LS05, LS07, LS10, LS15	FTV15-110,FTV15C-110,FTV10-110,FTV10C-110,FTV20-110,FTV20C-110,FTV10-150,FTV10C-150,FTV15-150,FTV15C-150,FTV20-150,FTV20C-150,FTV30-150,FTV30C-150,FTV40-150,FTV40C-150,FTV60-150,FTV60C-150,FTV10C-110SW,FTV20C-110SWTL05C-220,TL07C-220		HF1214J-2
M40.5 P=0.5		TL40C-240,TL60C-240		HF0818J-2,HS1214V,HS1614V,HS2514V,HS3516V,HS5016V,HS7520V
M43 P=0.75		FTV07-150,FTV07C-150,FTV08-150,FTV08C-150,MGTL04VM,MGTL04VMC		MV0316,HF1216V DN, HF1616V DN,HF2516V DN, HF3516V DN,HF5018V DN
M46 P=0.75	XLS03, XLS05, XLS075, XLS10, XLS14, XLS20	FTV07-110,FTV07C-110,FTV08-110,FTV08C-110,MGTL04		HF3514V-2,HS10028V, HF7520V DN
M49 P=0.75	FV3526L	MGTL03VM, MGTL03VMC, MGTL0345VM, MGTL0345VMC, MGTL03,MGTL05-1.1		HF1618V-2, HF5018V-2
M52 P=0.75	LSF3528	LSTL078TW,FTV05-110,FTV05C-110		HF2514V-2
M55 P=0.75		LSTL15H,LSTL20H,FTV05-150,FTV05C-150		HF0528J-2,HF7518V-2, VV1618HF DN
M58 P=0.75	SP10,SP20,XLS01,XLS02,WF5045,MS3520,HB5014,SP05,SP07,SP14,UL035,UL05,UL07,UL10	MGTL0275-2		HS0818V,HS0420H(Option),MS3520-C
M62 P=0.75	MS1828,MS2524,LSP350,FV5026L,FV5026W,LSF10528	MGTL022VM,MGTL023		HF1218V(Option),MS1828-C,MS2524-C
M67 P=0.75	LSF5028	LSTL10H,MGTL0275V,MGTL023H,MGTL014,MGTL019		
M72 P=0.75	LSF20035	MGTL03VC,MGTL03V		
M77 P=0.75	LSF2528,FV8528W	MGTL017VM,MGTL019VM		
M82 P=0.75	FV8528L	LSTL055TW,MGTL0345V		
M95 P=1.0		MGTL014VM,MGTL014VM-180		

Optical Lens Parts

Customization is available



Unpolarized Beam Splitter			
Wavelength	400nm-700nm	Model	Dimension(mm)
Coating	Slope: Dielectric multilayer coating Side: AR multi-coated	BS-10	10×10×10
Spectral ratio	T : R = 50 : 50	BS-15	15×15×15
Surface tolerance	$\lambda / 4$	BS-20	20×20×20
Angle	±3°	BS-25	25×25×25
Size tolerance	+0.1 / -0.3mm		
Material	BK-7		



Polarized beam splitter			
Wavelength	450nm-650nm	Model	Dimension(mm)
Coating	Slope: Dielectric multilayer coating Side: AR multi-coated	BSP-03	3×3×3
Spectral ratio	Tp > 95 Rs > 95	BSP-05	5×5×5
Surface tolerance	$\lambda / 4$	BSP-08	8×8×8
Angle	±3°	BSP-10	10×10×10
Size tolerance	+0.1 / -0.3mm		
Material	BK-7		



Half mirror				
Coating	Surface: Dielectric multilayer coating Rear surface : AR multi-coated	Model	Dimension(mm)	Thickness(mm)
Spectral ratio	T : R = 50 : 50	HM-30-1	30×30	1
Surface tolerance	$\lambda - 3 \lambda$	HM-50-1	50×50	1
Parallelism	Within 1°	HM-100-1	100×100	1
Angle of incidence	45°	HM-30-2	30×30	2
Material	Crown	HM-50-2	50×50	2
		HM-100-2	100×100	2



Aluminized surface mirror				
Coating	Aluminum + SiO2	Model	Dimension(mm)	Thickness(mm)
Surface tolerance	λ	AM-5	5×5	1
Size tolerance	+0 / -0.2mm	AM-10	10×10	1
Material	Crown	AM-30	30×30	2
		AM-50	50×50	3
		AM-100	100×100	3



Right angle prism			
Coating	Slope: Aluminum coated Vertical plane: AR multi-coated	Model	Dimension(mm)
Surface tolerance	$\lambda / 2$	TP-5	5×5×5
Angle	±3°	TP-10	10×10×10
Size tolerance	+0 / -0.2mm	TP-15	15×15×15
Material	BK-7	TP-20	20×20×20
		TP-25	25×25×25
		TP-30	30×30×30
		TP-40	40×40×40
		TP-50	50×50×50



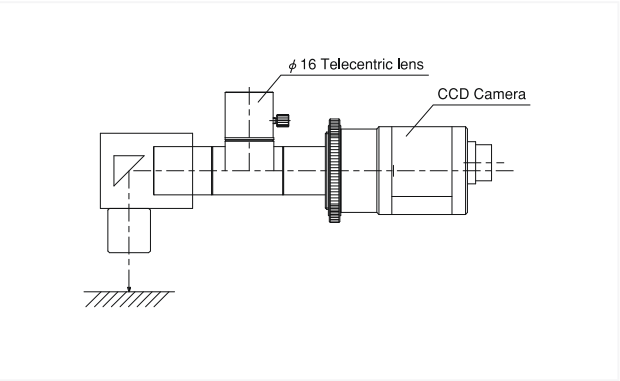
Penta prism			
Coating	Two sided: AR multi-coated Two sided: black coated aluminum	Model	Dimension(mm)
Surface tolerance	$\lambda / 2$	PP-5	5×5×5
Angle	±3°	PP-10	10×10×10
Size tolerance	±0.2mm	PP-15	15×15×15
Material	BK-7	PP-20	20×20×20
		PP-25	25×25×25
		PP-30	30×30×30

Prism Adapter

Prism adapters for telecentric lenses

✚ Bend the optical axis at 90° and suitable for mark recognition

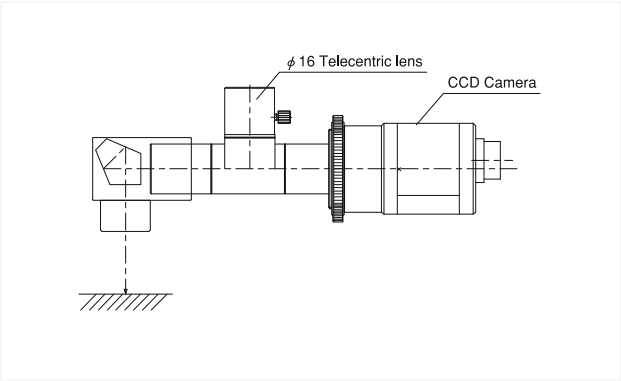
90° slide-looking rectangular mirror type



Optical axis can be bent 90°degrees. Effective when there is no space above the object. Monitored image is a mirror image.

Model	Compatible model
TL-PM16-1	φ 16 Telecentric Series
TL-PM22-1	WD220 Telecentric φ 22
TL-PM39-1	WD220 Telecentric φ 39

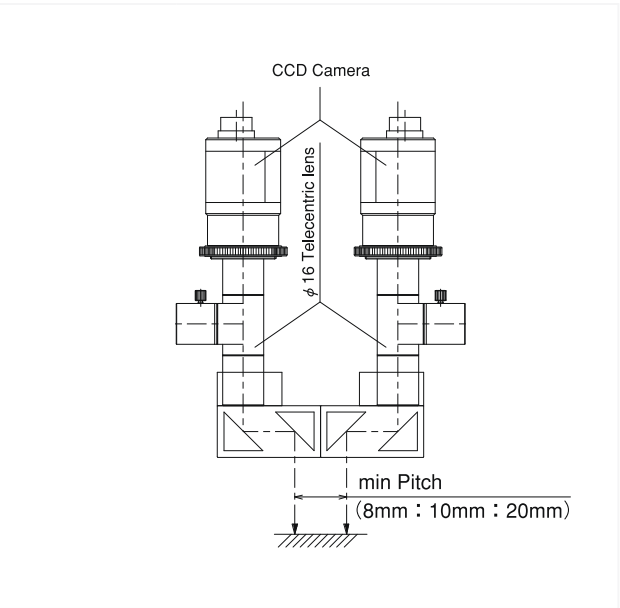
90° slide-looking pentaprism type



Optical axis can be bent 90°degrees. Effective when there is no space above the object. Monitored image is an electing image.

Model	Compatible model
TL-PP16-1	φ 16 Telecentric Series
TL-PP22-1	WD220 Telecentric φ 22
TL-PP39-1	WD220 Telecentric φ 39

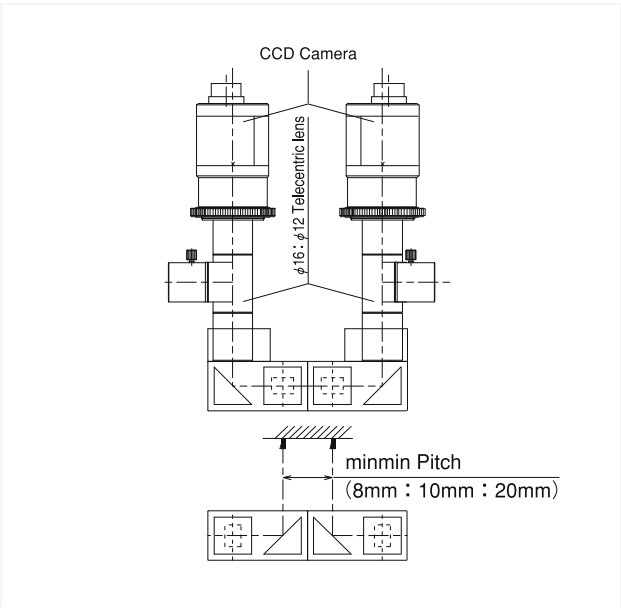
Optical axis pitch conversion type



Narrow pitch marks between two points can be recognized.

Model	Compatible model
TL-PT16-1	φ 16 Telecentric (Pitch 8mm/One side 4mm)
TL-PT16-2	φ 16 Telecentric (Pitch 10mm/One side 5mm)
TL-PT16-3	φ 16 Telecentric (Pitch 20mm/One side 10mm)

Optical axis pitch 90° conversion type



Narrow pitch marks between two points can be recognized. Effective when there is no space above the object.

Model	Compatible model
TL-PTV16-1	φ 16 Telecentric (Pitch 8mm/One side 4mm)
TL-PTV16-2	φ 16 Telecentric (Pitch 10mm/One side 5mm)
TL-PTV16-3	φ 16 Telecentric (Pitch 20mm/One side 10mm)



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