



CBC GROUP

2015.3

computar[®]

FACTORY AUTOMATION LENS

FA

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NEW PRODUCTS

MPW2 series

M0824-MPW2



M1224-MPW2



M1620-MPW2



M2518-MPW2



M3520-MPW2



M5028-MPW2



5 megapixel C-mount Lens

- Ultra low distortion.
- Higher relative illumination rate
- Compact design
- Locking screws for focus and iris.
- J1A Standard 5 megapixel A-rank.

ITS series

MG2514KC-MPIR



MG3520FC-MPIR



MG5020FC-MPIR



TEC series

TEC-M55MPW



TEC-M55



TEC-V7X



5MP Monofocal lens for ITS systems

- Wide variety of product line up 9 ~ 50mm.
(25, 35, 50mm are IR corrected)
- Compatible with CMOSIS sensor "CMV2000".
(25, 35, 50mm)
- High resolution for 5MP sensors.

Telecentric Lens

- Low distortion
- For large sensor format (2/3" and 1.1")
- Higher relative illuminance.

Introduction

When setting up your vision system, the lens may be one of the last components you choose. Once your system is up and running, however, **your data flows from the lens first.** That makes lens choice one of the most impactful decisions that will determine how well your vision system works for you. With the success of your next project on the line, turn to a partner with over 40 years of experience in precision-engineered optics.

Computar's Factory Automation line of lenses is engineered to meet the challenges of the most demanding vision systems. Featuring an unrivaled compact form factor, ultra-low distortion optics and a robust design meant to last decades, Computar lenses are quality you can count on. And with multiple format, resolution and iris options, Computar has the right fit for your application.

Don't let the lens be the weak link in your system. Choosing a great lens tailored to your system's needs can be daunting, but that's what we're here for. Talk to a lens specialist at Computar today and find out how we can assist in selecting the correct lens that will not only work with your system, but expand its potential.

In addition to high-quality products, we focus on creating an unparalleled service experience for our customers. Our sales and technical support staff operate across a vast network; meaning day or night a lens expert is a phone call away in a town near you. This, combined with our first-class inventory system, allows you to rapidly select, receive and integrate Computar lenses into your application.

With a solid foundation based on Japanese engineering and agile production facilities spanning the globe, we operate under a dual mandate to create the highest-quality optics products at an economical price point that works within your budget.

In the following pages, you'll find out more about the product family that has made Computar the gold standard in optics across a variety of industries.

We encourage you to contact us about any of our products, and find out for yourself how choosing Computar will enable your application to **See Everything. Clearly.**

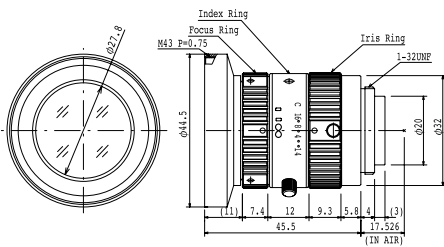
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- Captures full resolution of megapixel cameras
- Low distortion (Less than 1.0%)
- Locking set screws for focus and iris

- High contrast & sharp picture in all areas of the screen
- Compact design-Diameter 33.5mm (H0514-MP : 44.5mm)

H0514-MP2



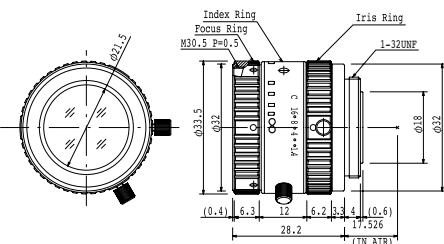
Focal Length	5mm		
Max. Aperture Ratio	1:1.4		
Max. Image Format	6.4mm x 4.8mm (φ8mm)		
Operation Range	Iris	F1.4 - F16C	
	Focus	0.1m - 0.9m	
Control	Iris	Manual	
	Focus	Manual	
Object Dimension at M.O.D.	15.0(H)cm x 11.1(V)cm 1/2"		
Angle of View	D	76.7°	62.3°
		51.4°	39.5°
	H	1/2"	1/3"
		V	
Operating Temperature	-10°C ~ +50°C		

Distortion	1/2"	-0.48% (y=4.0)	1/3"	-2.26% (y=3.0)
BackFocal Length	10.8mm (WD=900mm)			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M43 P=0.75mm			
Dimensions	φ 44.5mm x 45.5mm			
Weight	102g			

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)			
			1/2"		1/3"	
			H	V	H	V
900	0.006X	-	1179.8	882.3	882.3	657.2
850	0.006X	-	1115.4	834.2	834.2	621.3
800	0.006X	-	1051.0	786.0	786.0	585.4
750	0.007X	-	986.6	737.8	737.8	549.5
700	0.007X	-	922.3	689.6	689.6	513.6
650	0.008X	-	857.9	641.4	641.4	477.7
600	0.008X	-	793.5	593.2	593.2	441.8
550	0.009X	-	729.1	545.0	545.0	405.9
500	0.010X	-	664.7	496.9	496.9	370.0
450	0.011X	-	600.3	448.7	448.7	334.1
400	0.012X	-	535.9	400.5	400.5	298.2
350	0.014X	-	471.5	352.3	352.3	262.3
300	0.016X	-	407.1	304.1	304.1	226.4
250	0.019X	-	342.7	255.9	255.9	190.5
200	0.024X	-	278.4	207.8	207.8	154.6
150	0.031X	-	214.0	159.6	159.6	118.7
100	0.044X	-	149.6	111.4	111.4	82.8

Field of View = CCD Size / Optical Magnification

M0814-MP2



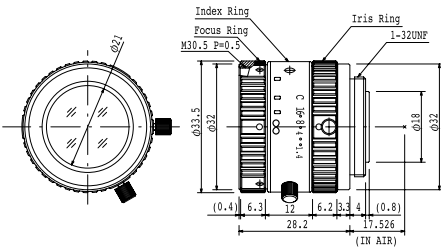
Focal Length	8mm		
Max. Aperture Ratio	1:1.4		
Max. Image Format	8.8mm x 6.6mm (φ11mm)		
Operation Range	Iris	F1.4 - F16C	
	Focus	0.1m - Inf.	
Control	Iris	Manual	
	Focus	Manual	
Object Dimension at M.O.D.	12.1(H)cm x 9.0(V)cm 2/3"		
Angle of View	D	67.1°	51.9°
		43.7°	32.4°
	H	2/3"	1/2"
		V	
Operating Temperature	-10°C ~ +50°C		

Distortion	2/3"	-0.1% (y=5.5)	1/2"	-1.1% (y=4.0)
BackFocal Length	13.1mm (Inf)			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M30.5 P=0.5mm			
Dimensions	φ 33.5mm x 28.2mm			
Weight	63g			

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)			
			2/3"		1/2"	
			H	V	H	V
900	0.009X	-	976.8	731.5	709.1	530.1
850	0.010X	-	923.3	691.4	670.2	501.0
800	0.010X	-	869.8	651.3	631.4	471.9
750	0.011X	-	816.3	611.2	592.5	442.8
700	0.012X	-	762.8	571.1	553.6	413.8
650	0.013X	-	709.3	531.0	514.7	384.7
600	0.014X	-	655.8	490.9	475.8	355.6
550	0.015X	-	602.3	450.8	437.0	326.5
500	0.016X	-	548.8	410.7	398.1	297.5
450	0.018X	-	495.3	370.6	359.2	268.4
400	0.020X	-	441.8	330.5	320.3	239.3
350	0.023X	-	388.3	290.4	281.4	210.2
300	0.027X	-	334.8	250.3	242.6	181.2
250	0.032X	-	281.2	210.2	203.7	152.1
200	0.039X	-	227.7	170.0	164.8	123.0
150	0.052X	-	174.2	129.9	125.9	93.9
100	0.075X	-	120.7	89.8	87.0	64.9

Field of View = CCD Size / Optical Magnification

M1214-MP2



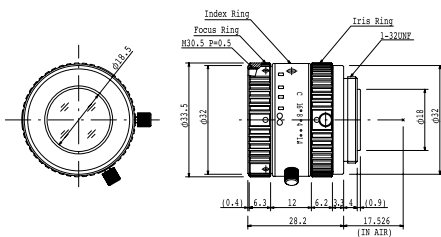
Focal Length	12mm		
Max. Aperture Ratio	1:1.4		
Max. Image Format	8.8mm x 6.6mm (φ11mm)		
Operation Range	Iris	F1.4 - F16C	
	Focus	0.15m - Inf.	
Control	Iris	Manual	
	Focus	Manual	
Object Dimension at M.O.D.	12.1(H)cm x 9.0(V)cm 2/3"		
Angle of View	D	49.2°	37.0°
		30.8°	22.7°
	V	30.8°	22.7°
Operating Temperature	-10° C ~ +50° C		

Distortion	2/3"	-0.1% (y=5.5)	1/2"	-0.35% (y=4.0)
Back Focal Length	13.1mm (Inf)			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M30.5 P=0.5mm			
Dimensions	φ 33.5mm x 28.2mm			
Weight	62g			

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)			
			2/3"		1/2"	
			H	V	H	V
900	0.013X	-	672.7	504.0	488.7	366.0
850	0.014X	-	635.9	476.4	461.9	345.9
800	0.015X	-	599.1	448.9	435.2	325.9
750	0.016X	-	562.4	421.3	408.4	305.9
700	0.017X	-	525.6	393.7	381.7	285.8
650	0.018X	-	488.8	366.1	355.0	265.8
600	0.020X	-	452.1	338.5	328.2	245.7
550	0.021X	-	415.3	311.0	301.5	225.7
500	0.023X	-	378.5	283.4	274.7	205.7
450	0.026X	-	341.7	255.8	248.0	185.6
400	0.029X	-	305.0	228.2	221.2	165.6
350	0.033X	-	268.2	200.6	194.5	145.6
300	0.038X	-	231.4	173.0	167.7	125.5
250	0.046X	-	194.7	145.5	141.0	105.5
200	0.056X	-	157.9	117.9	114.3	85.4
150	0.074X	-	121.1	90.3	87.5	65.4
100	0.106X	0.5	84.3	62.7	60.8	45.4

Field of View = CCD Size / Optical Magnification

M1614-MP2



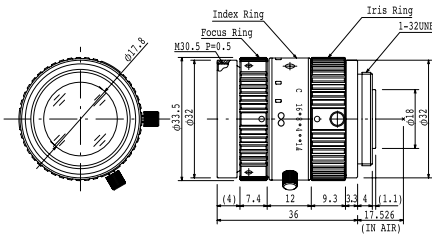
Focal Length	16mm		
Max. Aperture Ratio	1:1.4		
Max. Image Format	8.8mm x 6.6mm (φ11mm)		
Operation Range	Iris	F1.4 - F16C	
	Focus	0.3m - Inf.	
Control	Iris	Manual	
	Focus	Manual	
Object Dimension at M.O.D.	17.2(H)cm x 12.9(V)cm 2/3"		
Angle of View	D	38.0°	28.2°
		23.4°	17.1°
	V	30.8°	22.7°
Operating Temperature	-10° C ~ +50° C		

Distortion	2/3"	-0.1% (y=5.5)	1/2"	-0.3% (y=4.0)
Back Focal Length	13.1mm (Inf)			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M30.5 P=0.5mm			
Dimensions	φ 33.5mm x 28.2mm			
Weight	60g			

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)			
			2/3"		1/2"	
			H	V	H	V
900	0.018X	-	503.2	376.8	365.4	273.7
850	0.019X	-	475.6	356.2	345.3	258.6
800	0.020X	-	448.0	335.5	325.3	243.6
750	0.021X	-	420.4	314.8	305.2	228.6
700	0.023X	-	392.8	294.1	285.2	213.6
650	0.024X	-	365.2	273.4	265.1	198.5
600	0.026X	-	337.6	252.8	245.1	183.5
550	0.029X	-	310.0	232.1	225.0	168.5
500	0.031X	-	282.5	211.4	204.9	153.5
450	0.035X	-	254.9	190.7	184.9	138.4
400	0.039X	-	227.3	170.0	164.8	123.4
350	0.044X	-	199.7	149.4	144.8	108.4
300	0.052X	-	172.1	128.7	124.7	93.4
250	0.061X	-	144.5	108.0	104.7	78.3
200	0.076X	-	116.9	87.3	84.6	63.3
150	0.100X	0.5	89.3	66.6	64.6	48.3
100	0.145X	1.0	61.7	45.9	44.5	33.2

Field of View = CCD Size / Optical Magnification

M2514-MP2



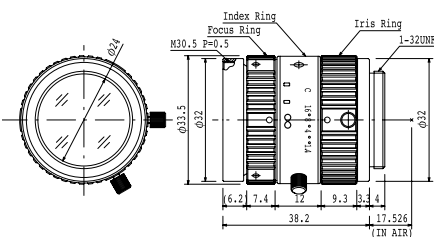
Focal Length	25mm		
Max. Aperture Ratio	1:1.4		
Max. Image Format	8.8mm x 6.6mm (φ11mm)		
Operation Range	Iris	F1.4 - F16C	
	Focus	0.3m - Inf.	
Control	Iris	Manual	
	Focus	Manual	
Object Dimension at M.O.D.	10.6(H)cm x 7.9(V)cm 2/3"		
Angle of View	D	24.9°	18.2°
		20.0°	14.6°
	V	15.1°	11.0°
Operating Temperature	-10°C ~ +50°C		

Distortion	2/3"	-0.3% (y=5.5)	1/2"	-0.1% (y=4.0)
Back Focal Length	13.1mm (Inf)			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M30.5 P=0.5mm			
Dimensions	φ 33.5mm x 36.0mm			
Weight	71g			

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)			
			2/3"		1/2"	
			H	V	H	V
900	0.028X	-	317.5	237.7	230.5	172.7
850	0.029X	-	299.9	224.5	217.7	163.1
800	0.031X	-	282.3	211.3	204.8	153.5
750	0.033X	-	264.6	198.1	192.0	143.9
700	0.036X	-	247.0	184.9	179.2	134.3
650	0.039X	-	229.4	171.6	166.4	124.7
600	0.042X	-	211.8	158.4	153.6	115.1
550	0.046X	-	194.1	145.2	140.8	105.5
500	0.050X	-	176.5	132.0	128.0	95.9
450	0.056X	-	158.9	118.8	115.2	86.3
400	0.063X	-	141.2	105.6	102.4	76.7
350	0.072X	-	123.6	92.4	89.6	67.1
300	0.084X	-	106.0	79.2	76.8	57.5
250	0.100X	-	88.3	66.0	63.9	47.9
200	0.126X	-	70.7	52.7	51.1	38.3
150	0.168X	-	53.0	39.5	38.3	28.7
100	0.253X	1.5	35.3	26.3	25.5	19.0

Field of View = CCD Size / Optical Magnification

M3514-MP



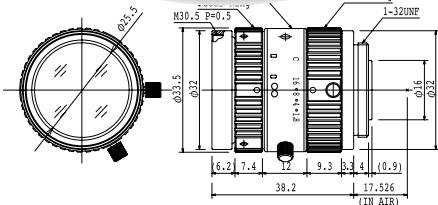
Focal Length	35mm		
Max. Aperture Ratio	1:1.4		
Max. Image Format	8.8mm x 6.6mm (φ11mm)		
Operation Range	Iris	F1.4 - F16C	
	Focus	0.3m - Inf.	
Control	Iris	Manual	
	Focus	Manual	
Object Dimension at M.O.D.	8.1(H)cm x 6(V)cm 2/3"		
Angle of View	D	17.3°	12.6°
		13.9°	10.1°
	V	10.4°	7.6°
Operating Temperature	-10°C ~ +50°C		

Distortion	2/3"	-0.8% (y=5.5)	1/2"	-0.4% (y=4.0)
Back Focal Length	17.1mm (WD=400mm)			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M30.5 P=0.5mm			
Dimensions	φ 33.5mm x 38.2mm			
Weight	87g			

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)			
			2/3"		1/2"	
			H	V	H	V
900	0.037	-	236.2	176.9	171.5	128.6
850	0.040	-	223.2	167.2	162.1	121.5
800	0.042	-	210.3	157.5	152.7	114.5
750	0.045	-	197.3	147.8	143.3	107.4
700	0.048	-	184.3	138.1	133.9	100.3
650	0.052	-	171.4	128.4	124.5	93.3
600	0.056	-	158.4	118.6	115.0	86.2
550	0.061	-	145.5	108.9	105.6	79.1
500	0.067	-	132.5	99.2	96.2	72.1
450	0.074	-	119.6	89.5	86.8	65.0
400	0.083	-	106.6	79.8	77.4	58.0
350	0.094	-	93.7	70.1	67.9	50.9
300	0.110	-	80.7	60.4	58.5	43.8
250	0.131	1	67.7	50.6	49.1	36.8
200	0.162	2	54.7	40.9	39.7	29.7
150	0.213	5	41.8	31.2	30.2	22.6
100	0.310	7	28.7	21.4	20.8	15.5

Field of View = CCD Size / Optical Magnification

M5018-MP2



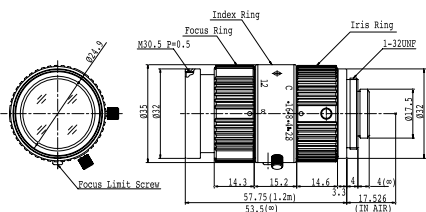
Focal Length	50mm		
Max. Aperture Ratio	1:1.8		
Max. Image Format	8.8mm x 6.6mm ($\phi 11$ mm)		
Operation Range	Iris	F1.8 - F16C	
	Focus	0.5m - Inf.	
Control	Iris	Manual	
	Focus	Manual	
Object Dimension at M.O.D.	8.7(H)cm x 6.5(V)cm 2/3"		
Angle of View	D	13.1°	9.5°
	H	2/3" 10.5°	1/2" 7.6°
	V	7.9°	5.7°
Operating Temperature	-10° C ~ +50° C		

Distortion	2/3"	-0.3% (y=5.5)	1/2"	-0.2% (y=4.0)
Back Focal Length	13.1mm (Inf)			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M30.5 P=0.5mm			
Dimensions	$\phi 33.5$ mm x 38.2mm			
Weight	85g			

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)			
			2/3"		1/2"	
			H	V	H	V
900	0.055X	-	160.8	120.4	116.7	87.5
850	0.058X	-	151.6	113.5	110.1	82.5
800	0.062X	-	142.4	106.6	103.4	77.5
750	0.066X	-	133.2	99.7	96.7	72.5
700	0.071X	-	124.0	92.9	90.0	67.5
650	0.077X	-	114.8	86.0	83.4	62.5
600	0.084X	-	105.6	79.1	76.7	57.5
550	0.092X	-	96.5	72.2	70.1	52.5
500	0.101X	-	87.3	65.3	63.3	47.5
450	0.113X	0.5	78.1	58.4	56.7	42.5
400	0.128X	1.5	68.9	51.6	50.0	37.5
350	0.148X	2.5	59.7	44.7	43.3	32.5
300	0.175X	3.5	50.5	37.8	36.6	27.4
250	0.214X	5.5	41.3	30.9	30.0	22.4
200	0.276X	8.5	32.1	24.0	23.3	17.4
150	0.387X	14.0	22.9	17.1	16.6	12.4
100	0.647X	26.5	13.6	10.2	9.9	7.4

Field of View = CCD Size / Optical Magnification

M7528-MP



Focal Length	75mm		
Max. Aperture Ratio	1:2.8		
Max. Image Format	8.8mm x 6.6mm ($\phi 11$ mm)		
Operation Range	Iris	F2.8 - F16C	
	Focus	0.3m - Inf. (※)	
Control	Iris	Manual	
	Focus	Manual	
Object Dimension at M.O.D.	4.1(H)cm x 3.1(V)cm 2/3"		
Angle of View	D	8.5°	6.2°
	H	2/3" 6.8°	1/2" 5°
	V	5.1°	3.7°
Operating Temperature	-10° C ~ +50° C		

Distortion	2/3"	-0.4% (y=5.5)	1/2"	-0.2% (y=4.0)
Back Focal Length	21.5mm (WD=400mm)			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M30.5 P=0.5mm			
Dimensions	$\phi 35$ mm x 57.75mm			
Weight	113g			

※ Factory setting is 0.3-1.2m. Focus can be adjusted to infinity by removing "Focus Limit Screw".

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)			
			2/3"		1/2"	
			H	V	H	V
900	0.077	-	113.8	85.4	82.8	62.1
850	0.082	-	107.8	80.8	78.4	58.8
800	0.086	-	101.7	76.3	74.0	55.5
750	0.092	-	95.7	71.8	69.6	52.2
700	0.098	-	89.6	67.2	65.2	48.9
650	0.105	-	83.6	62.7	60.8	45.6
600	0.114	-	77.6	58.1	56.4	42.3
550	0.123	-	71.5	53.6	52.0	39.0
500	0.135	-	65.5	49.1	47.6	35.7
450	0.148	-	59.4	44.5	43.2	32.4
400	0.165	-	53.4	40.0	38.8	29.1
350	0.187	-	47.3	35.4	34.4	25.8
300	0.214	-	41.3	30.9	30.0	22.5
250	0.251	5	35.2	26.4	25.6	19.1
200	0.304	7	29.2	21.8	21.2	15.8
150	0.384	13	23.1	17.3	16.8	12.5
100	0.522	23	17.1	12.7	12.3	9.2

Field of View = CCD Size / Optical Magnification

5 MEGAPIXEL ULTRA LOW DISTORTION LENSES

FACTORY AUTOMATION LENS

- Ultra low distortion (optical distortion 0.1% or less)
- Higher relative illumination rate
- Compact design

- Locking set screws for focus and iris

NEW

M0824-MPW2

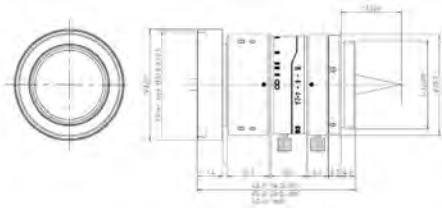


Focal Length	8mm	
Max. Aperture Ratio	1:2.4	
Max. Image Format	8.8mm x 6.6mm (φ 11mm)	
Operation Range	Iris	F2.4 - F16.0
	Focus	0.05m - Inf.
Control	Iris	Manual
	Focus	Manual
Object Dimension at M.O.D.	5.4cm x 7.4cm 2/3"	
Angle of View	D	69.32°
	H	57.80°
	V	44.36°

Distortion	2/3"	1.87%(y=5.5)	1/1.8"	-1.55%(y=4.32)	1/2"	-1.42%(y=4.0)
Back Focal Length	13.7mm(WD=300mm)					
Flange Back Length	17.526mm					
Mount	C-Mount					
Filter Size	M32.0 P=0.5mm					
Dimensions	φ 32mm x 45.71mm					
Weight	80.0g					

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)					
			2/3"		1/1.8"		1/2"	
			H	V	H	V	H	V
900	-0.009	-	1011.1	755.4	791.6	591.5	732.2	547.3
850	-0.009	-	956.0	714.2	748.5	559.3	692.3	517.4
800	-0.010	-	900.9	673.0	705.3	527.0	652.3	487.6
750	-0.011	-	845.8	631.8	662.1	494.7	612.4	457.7
700	-0.011	-	790.7	590.6	618.9	462.5	572.5	427.8
650	-0.012	-	735.6	549.4	575.8	430.2	532.5	398.0
600	-0.013	-	680.4	508.2	532.6	397.9	492.6	368.1
550	-0.014	-	625.3	467.0	489.4	365.6	452.6	338.3
500	-0.016	-	570.0	425.6	446.0	333.2	412.6	308.2
450	-0.017	-	515.0	384.4	403.0	301.0	372.6	278.4
400	-0.019	-	459.8	343.2	359.8	268.8	332.6	248.6
350	-0.022	-	404.6	302.0	316.6	236.4	292.8	218.8
300	-0.026	-	349.6	260.8	273.4	204.2	252.8	188.8
250	-0.030	-	294.4	219.6	230.2	171.8	212.8	159.0
200	-0.037	-	239.4	178.4	187.0	139.6	173.0	129.2
150	-0.049	-	184.2	137.2	143.8	107.4	133.0	99.2
100	-0.070	-	129.0	96.0	100.6	75.0	93.0	69.4
50	-0.127	-	71.4	52.9	55.5	41.3	51.3	38.2

Field of View = CCD Size / Optical Magnification



NEW

M1224-MPW2

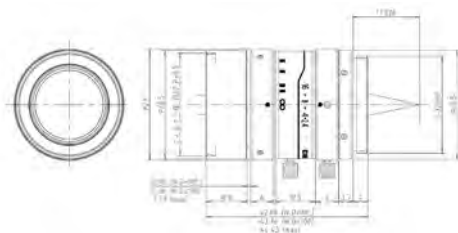


Focal Length	12mm	
Max. Aperture Ratio	1:2.4	
Max. Image Format	8.8mm x 6.6mm (φ 11mm)	
Operation Range	Iris	F2.4 - F16.0
	Focus	0.1m - Inf.
Control	Iris	Manual
	Focus	Manual
Object Dimension at M.O.D.	6.4cm x 8.5cm 2/3"	
Angle of View	D	48.6°
	H	39.1°
	V	36.5°

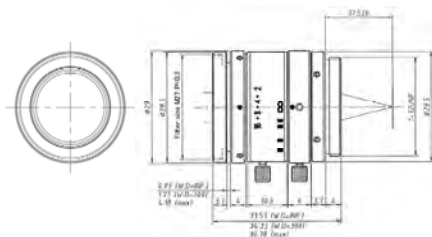
Distortion	2/3"	-0.05%(y=5.5)	1/1.8"	-0.34%(y=4.32)	1/2"	-0.35%(y=4.0)
Back Focal Length	14.4mm(WD=300mm)					
Flange Back Length	17.526mm					
Mount	C-Mount					
Filter Size	M27.0 P=0.5mm					
Dimensions	φ 29mm x 42.68mm					
Weight	72.0g					

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)					
			2/3"		1/1.8"		1/2"	
			H	V	H	V	H	V
900	-0.0131	-	671.2	503.7	527.5	395.5	488.4	366.1
850	-0.0138	-	634.6	476.2	498.7	373.9	461.8	346.1
800	-0.0147	-	598.0	448.7	469.9	352.3	435.1	326.1
750	-0.0157	-	561.4	421.2	441.1	330.7	408.4	306.1
700	-0.016	-	524.7	393.7	412.3	309.1	381.8	286.1
650	-0.018	-	488.1	366.2	383.5	287.5	355.1	266.1
600	-0.019	-	451.5	338.7	354.7	265.9	328.4	246.1
550	-0.021	-	414.8	311.2	325.9	244.3	301.7	226.1
500	-0.022	-	378.2	283.7	297.2	222.7	275.1	206.2
450	-0.026	-	341.6	256.2	268.4	201.1	248.4	186.2
400	-0.029	-	305.0	228.7	239.6	179.5	221.8	166.2
350	-0.033	-	268.3	201.2	210.8	157.9	195.1	146.2
300	-0.038	-	231.7	173.7	182.0	136.3	168.4	126.2
250	-0.045	-	195.1	146.2	153.2	114.7	141.8	106.2
200	-0.056	-	158.5	118.7	124.4	93.1	115.1	86.2
150	-0.073	-	121.8	91.2	95.6	71.5	88.4	66.2
100	-0.104	-	85.2	63.7	66.8	50.0	61.8	46.2

Field of View = CCD Size / Optical Magnification



M1620-MPW2



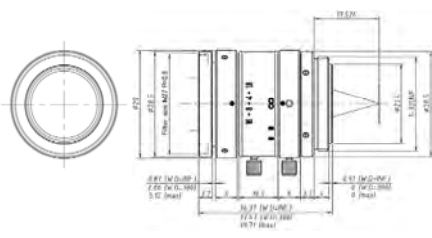
Focal Length	16mm	
Max. Aperture Ratio	1:2.0	
Max. Image Format	8.8mm x 6.6mm (φ 11mm)	
Operation Range	Iris	F2.0 - F16.0
	Focus	0.2m - Inf.
Control	Iris	Manual
	Focus	Manual
Object Dimension at M.O.D.	8.8cm x 11.74cm 2/3"	
Angle of View	D	37.7°
	H	30.7°
	V	23.3°

Distortion	2/3" 0.09%(y=5.5)	1/1.8" -0.06%(y=4.32)	1/2" -0.07%(y=4.0)
Back Focal Length	14.7mm (WD=300mm)		
Flange Back Length	17.526mm		
Mount	C-Mount		
Filter Size	M27.0 P=0.5mm		
Dimensions	φ 29mm x 33.53mm		
Weight	53g		

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)					
			2/3"		1/1.8"		1/2"	
			H	V	H	V	H	V
900	-0.018	-	501.2	376.4	393.5	296.7	365.0	273.9
850	-0.019	-	473.8	355.8	372.0	280.5	345.1	258.9
800	-0.020	-	446.4	335.2	350.4	264.2	325.1	243.9
750	-0.021	-	418.9	314.6	328.9	248.0	305.1	228.9
700	-0.022	-	391.5	294.0	307.4	231.7	285.1	213.9
650	-0.024	-	364.1	273.4	285.8	215.5	265.2	198.9
600	-0.026	-	336.7	252.8	264.3	199.3	245.2	183.9
550	-0.028	-	309.3	232.2	242.8	183.0	225.2	168.9
500	-0.031	-	281.9	211.6	221.2	166.8	205.2	153.9
450	-0.035	-	254.5	191.0	199.7	150.5	185.2	138.9
400	-0.039	-	227.1	170.4	178.2	134.3	165.3	124.0
350	-0.044	-	199.7	149.8	156.6	118.0	145.3	109.0
300	-0.0511	-	172.2	129.2	135.1	101.8	125.3	94.0
250	-0.061	-	144.8	108.6	113.6	85.6	105.1	79.2
200	-0.075	-	117.4	88.0	92.0	69.3	85.3	64.0
150	-0.098	0.5	90.0	67.4	70.5	53.1	65.3	49.0
100	-0.142	0.5	62.5	46.8	48.9	36.8	45.4	34.0

Field of View = CCD Size / Optical Magnification

M2518-MPW2



Focal Length	25mm	
Max. Aperture Ratio	1:1.8	
Max. Image Format	8.8mm x 6.6mm (φ 11mm)	
Operation Range	Iris	F1.8 - F16.0
	Focus	0.2m - Inf.
Control	Iris	Manual
	Focus	Manual
Object Dimension at M.O.D.	5.48cm x 7.31cm 2/3"	
Angle of View	D	24.6°
	H	19.9°
	V	15.0°

Distortion	2/3" 0.03%(y=5.5)	1/1.8" -0.02%(y=4.32)	1/2" -0.02%(y=4.0)
Back Focal Length	13.8mm (WD=300mm)		
Flange Back Length	17.526mm		
Mount	C-Mount		
Filter Size	M27.0 P=0.5mm		
Dimensions	φ 29mm x 36.37mm		
Weight	60g		

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)					
			2/3"		1/1.8"		1/2"	
			H	V	H	V	H	V
900	-0.028	-	318.2	238.9	249.8	188.4	231.7	173.9
850	-0.029	-	300.7	225.8	236.0	178.0	219.0	164.3
800	-0.031	-	283.2	212.6	222.3	167.6	206.2	154.7
750	-0.033	-	265.7	199.5	208.5	157.2	193.5	145.2
700	-0.035	-	248.2	186.3	194.8	146.9	180.7	135.6
650	-0.038	-	230.7	173.2	181.0	136.5	168.0	126.0
600	-0.041	-	213.2	160.0	167.3	126.1	155.2	116.4
550	-0.045	-	195.7	146.9	153.6	115.8	142.5	106.9
500	-0.049	-	178.2	133.7	139.8	105.4	129.7	97.3
450	-0.055	-	160.7	120.6	126.1	95.0	116.9	87.7
400	-0.061	-	143.2	107.4	112.3	84.7	104.2	78.1
350	-0.070	-	125.7	94.3	98.6	74.3	91.4	68.6
300	-0.081	-	108.2	81.1	84.8	63.9	78.7	59.0
250	-0.097	-	90.7	68.0	71.1	53.5	65.9	49.4
200	-0.121	-	73.1	54.8	57.3	43.2	53.1	39.8
150	-0.159	-	55.6	41.6	43.5	32.8	40.4	30.3
100	-0.233	5	38.0	28.5	29.8	22.4	27.6	20.7

Field of View = CCD Size / Optical Magnification

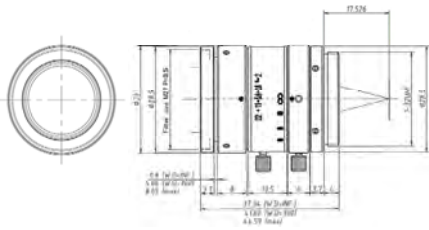
5 MEGA PIXEL ULTRA LOW DISTORTION LENSES

FACTORY AUTOMATION LENS

- Ultra low distortion (optical distortion 0.1% or less)
- Higher relative illumination rate

- Compact design
- Locking set screws for focus and iris

M3520-MPW2



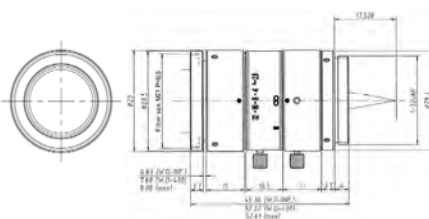
Focal Length	35mm	
Max. Aperture Ratio	1:2.0	
Max. Image Format	8.8mm x 6.6mm (φ 11mm)	
Operation Range	Iris	F2.0 - F22.0
	Focus	0.2m - Inf.
Control	Iris	Manual
	Focus	Manual
Object Dimension at MOD.	3.48cm x 4.63cm 2/3"	
Angle of View	D	17.8°
	H	2/3" 14.3°
		1/1.8" 11.2°
V	1/2" 10.4°	
		8.5°
Operating Temperature	-10° C ~ +50° C	

Distortion	2/3" 0.011%(y)=5.5]	1/1.8" 0.010%(y)=4.32]	1/2" 0.009%(y)=4.0]
Back Focal Length	18.0mm (WD=300mm)		
Flange Back Length	17.526mm		
Mount	C-Mount		
Filter Size	M27.0 P=0.5mm		
Dimensions	φ 29mm x 37.34mm		
Weight	59g		

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)					
			2/3"		1/1.8"		1/2"	
			H	V	H	V	H	V
900	-0.040	-	221.8	166.4	174.0	131.2	161.4	121.1
850	-0.042	-	209.3	157.0	164.2	123.8	152.3	114.2
800	-0.045	-	196.7	147.6	154.3	116.3	143.2	107.4
750	-0.048	-	184.2	138.2	144.5	108.9	134.0	100.6
700	-0.051	-	171.7	128.8	134.7	101.5	124.9	93.7
650	-0.055	-	159.2	119.4	124.8	94.1	115.8	86.9
600	-0.060	-	146.6	110.0	115.0	98.7	106.7	80.0
550	-0.066	-	134.1	100.6	105.2	79.3	97.6	73.2
500	-0.072	-	121.6	91.2	95.3	71.9	88.4	66.3
450	-0.081	-	109.0	81.8	85.5	64.5	79.3	59.5
400	-0.091	-	96.5	72.4	75.7	57.0	70.2	52.7
350	-0.105	-	84.0	63.0	65.8	49.6	61.1	45.8
300	-0.123	-	71.4	53.6	56.0	42.2	52.0	39.0
250	-0.150	-	58.9	44.2	46.2	34.8	42.8	32.1
200	-0.190	-	46.3	34.8	36.3	27.4	33.7	25.3
150	-0.261	5	33.8	25.3	26.5	20.0	24.6	18.4
100	-0.417	10	21.2	15.9	16.6	12.5	15.4	11.5

Field of View = CCD Size / Optical Magnification

M5028-MPW2



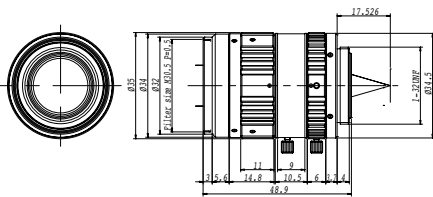
Focal Length	50mm	
Max. Aperture Ratio	1:2.8	
Max. Image Format	8.8mm x 6.6mm (φ 11mm)	
Operation Range	Iris	F2.8 - F32.0
	Focus	0.4m - Inf.
Control	Iris	Manual
	Focus	Manual
Object Dimension at MOD.	4.78cm x 6.38cm 2/3"	
Angle of View	D	12.5°
	H	2/3" 10.0°
		1/1.8" 7.9°
V	1/2" 7.3°	
		5.9°
Operating Temperature	-10° C ~ +50° C	

Distortion	2/3" 0.027%(y)=5.5]	1/1.8" 0.017%(y)=4.32]	1/2" 0.015%(y)=4.0]
Back Focal Length	27.7mm (WD=400mm)		
Flange Back Length	17.526mm		
Mount	C-Mount		
Filter Size	M27.0 P=0.5mm		
Dimensions	φ 29mm x 45.36mm		
Weight	69g		

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)					
			2/3"		1/1.8"		1/2"	
			H	V	H	V	H	V
900	-0.058	-	151.7	113.8	118.9	89.6	110.3	82.7
850	-0.062	-	142.9	107.2	112.0	84.4	103.9	77.9
800	-0.066	-	134.1	100.6	105.1	79.2	97.5	73.1
750	-0.070	-	125.3	94.0	98.2	74.0	91.1	68.3
700	-0.075	-	116.5	87.4	91.3	68.9	84.7	63.6
650	-0.082	-	107.7	80.8	84.5	63.7	78.3	58.8
600	-0.089	-	98.9	74.2	77.6	58.5	71.9	54.0
550	-0.098	-	90.1	67.6	70.7	53.3	65.6	49.2
500	-0.108	-	81.3	61.0	63.8	48.1	59.2	44.4
450	-0.121	-	72.6	54.4	56.9	42.9	52.8	39.6
400	-0.138	-	63.8	47.8	50.0	37.7	46.4	34.8
350	-0.160	1	55.0	41.2	43.1	32.5	40.0	30.0
300	-0.191	5	46.2	34.6	36.2	27.3	33.6	25.2
250	-0.235	5	37.4	28.1	29.3	22.1	27.2	20.4
200	-0.308	10	28.6	21.5	22.4	16.9	20.8	15.6
150	-0.445	20	19.8	14.9	15.5	11.7	14.4	10.8
100	-0.801	40	11.0	8.2	8.6	6.5	8.0	6.0

Field of View = CCD Size / Optical Magnification

M2518-MPW



Focal Length		25mm	
Max. Aperture Ratio		1:1.8	
Max. Image Format		8.8mm x 6.6mm (φ 11mm)	
Operation Range	Iris	F1.8 - F16.0	
	Focus	0.15m - Inf.	
Control	Iris	Manual	
	Focus	Manual	
Object Dimension at M.O.D.		4.10cm x 5.48cm 2/3"	
Angle of View	D	25.4°	20.1°
	H	2/3" 20.5°	1/1.8" 16.1°
	V	15.4°	12.2°
Operating Temperature		-10° C ~ +50° C	

Distortion	2/3"	0.03%(y=5.5)	1/1.8"	-0.02%(y=4.32)	1/2"	-0.02%(y=4.0)
Back Focal Length	14.0mm (WD=300mm)					
Flange Back Length	17.526mm					
Mount	C-Mount					
Filter Size	M30.5 P=0.5mm					
Dimensions	φ 35mm x 48.90mm					
Weight	102g					

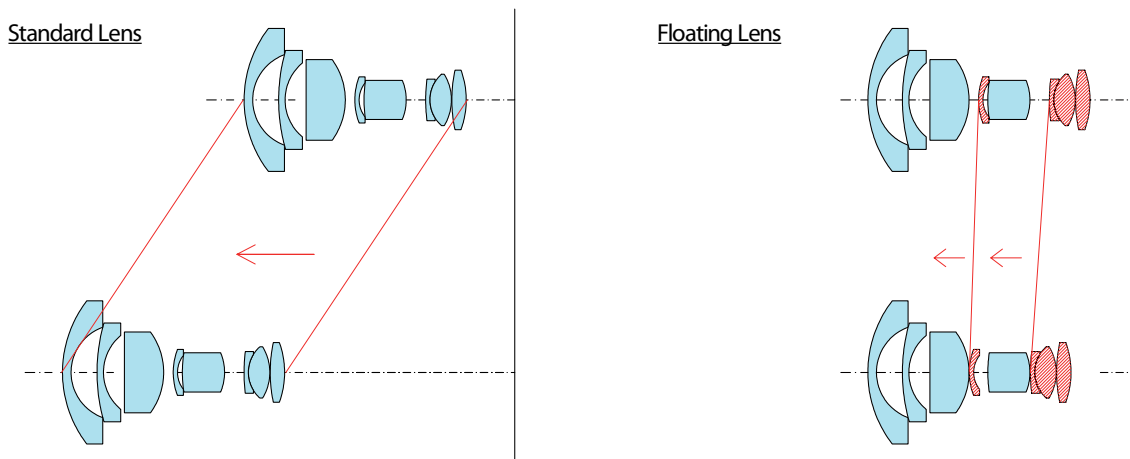
Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View(mm)					
			2/3"		1/1.8"		1/2"	
			H	V	H	V	H	V
900	-0.027	-	325.4	243.4	254.5	191.9	236.1	177.1
850	-0.029	-	306.2	229.9	240.3	181.2	222.9	167.3
800	-0.030	-	288.2	216.3	226.1	170.5	209.8	157.4
750	-0.033	-	270.2	202.8	212.0	159.8	196.7	147.5
700	-0.035	-	252.1	189.3	197.8	149.2	183.5	137.7
650	-0.038	-	234.1	175.7	183.7	138.5	170.4	127.8
600	-0.041	-	216.1	162.2	169.5	127.8	157.3	118.0
550	-0.044	-	198.1	148.7	155.4	117.1	144.2	108.1
500	-0.049	-	180.1	135.1	141.3	106.5	131.0	98.3
450	-0.054	-	162.1	121.6	127.1	95.8	117.9	88.5
400	-0.061	-	144.1	108.1	113.0	85.2	104.8	78.6
350	-0.070	-	126.1	94.6	98.9	74.5	91.7	68.8
300	-0.081	-	108.2	81.1	84.8	63.9	78.7	59.0
250	-0.098	-	90.3	67.7	70.8	53.3	65.6	49.2
200	-0.122	-	72.4	54.3	56.8	42.8	52.6	39.5
150	-0.161	-	54.8	41.0	42.9	32.3	39.8	29.8
100	-0.236	-	37.5	28.1	29.4	22.1	27.2	20.4

Field of View = CCD Size / Optical Magnification

FLOATING

Basically, lens is designed to show the best performance at a certain working distance. Due to this design, a curvature of field* is caused at other working distances, and the picture deteriorates at the corners. This curvature of field is able to be modified by a method called Floating, which makes several lens element groups move differently and controls aberration. It can provide stable picture quality from short object distances to infinity.

*Curvature of field: Phenomenon caused by the gap of the focal point between center and corner



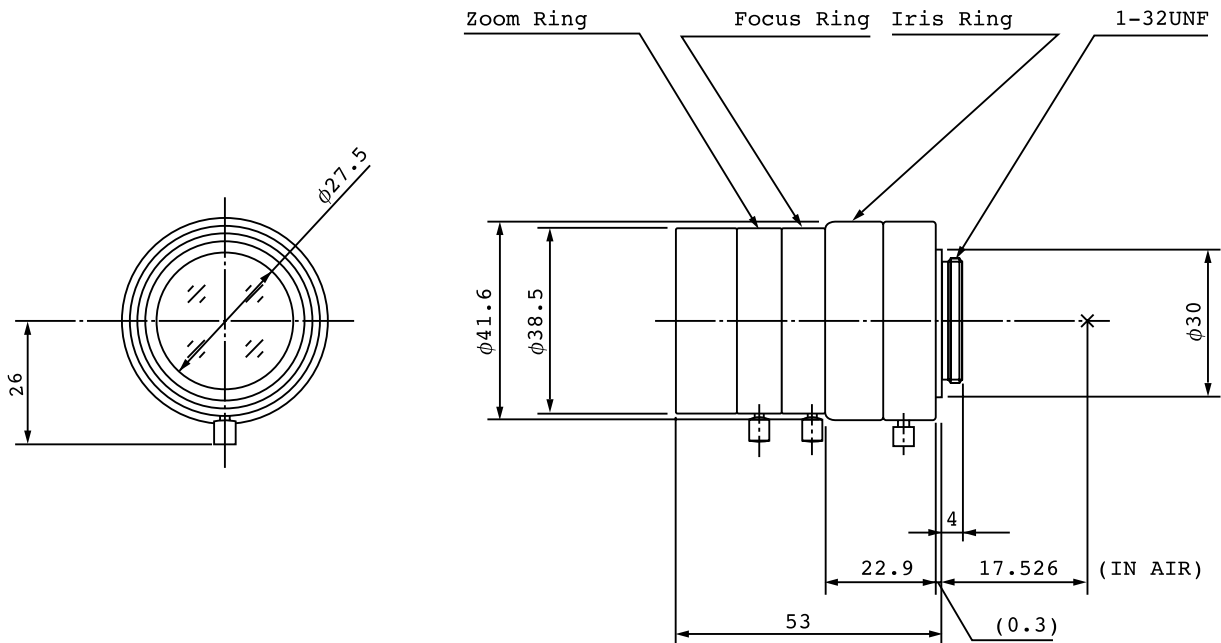
- Useful range of focal length for Factory Automation: f=12mm - 36mm
- Locking set screws for zoom, focus and iris

M3Z1228C-MP



Focal Length	12mm - 36mm			Effective Lens Aperture	Front	φ 27.2mm				
Max. Aperture Ratio	1 : 2.8			Effective Lens Aperture	Rear	φ 12.1mm				
Max. Image Format	8.8mm x 6.6mm (φ 11 mm)			Back Focal Length	Tele	13.5mm				
Operation Range	Iris	F2.8 - F16C			Back Focal Length	Wide	14.7mm			
	Focus	0.2m - Inf.(Tele) 0.05m - Inf.(Wide)			Distortion	Tele	2/3"	+3.5% (y=5.5)	1/2"	+1.7% (y=4.0)
	Zoom	12mm-36mm								
Control	Iris	Manual			Flange Back Length	17.526mm				
	Focus	Manual			Mount	C-Mount				
	Zoom	Manual			Filter Size	M35.5 P=0.5mm				
Object Dimension at M.O.D.	12mm	4.0(H)cm x 3.0(V)cm 2/3"			Dimensions	φ 41.6mm x 53mm				
	36mm	4.8(H)cm x 3.6(V)cm 2/3"			Weight	105g				
Angle of View	D	50.4° - 16.8°		37.5° - 12.5°						
	H	2/3"	41.0° - 13.6°	1/2"	30.2° - 10.0°					
	V	31.2° - 10.4°		22.8° - 7.6°						
Operating Temperature	-10°C ~ +50°C									

※Please note M3Z1228C-MP is produced to order



MACRO ZOOM LENS

FACTORY AUTOMATION LENS



- Wide zoom range for general inspection, documentation, and visual aid applications

MLH-10X

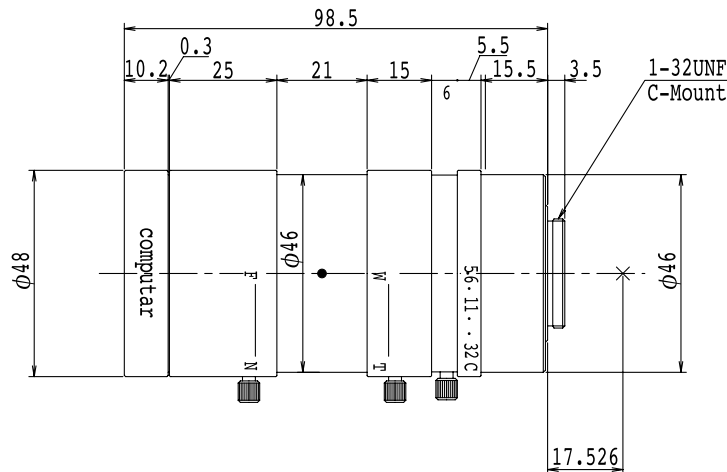


Optical Magnification	0.084X - 0.84X			
Max. Magnification	0.084mm - 0.84mm			
Max. Aperture Ratio	1:5.6			
Max. Image Format	6.4mm x 4.8mm (φ 8mm)			
Operation Range	Iris	F5.6 - F32C		
	Focus	0.15m - 0.45m		
Control	Iris	Manual		
	Focus	Manual		
	Zoom	Manual		
Angle of View	D	21.6° - 4.5°	17.0° - 3.3°	13.0° - 2.5°
	H	1/2" 18.0° - 3.6°	1/3" 13.8° - 2.7°	1/4" 10.6° - 2.0°
	V	13.8° - 2.7°	10.6° - 2.0°	8.0° - 1.5°
Operating Temperature	-10° C ~ +50° C			

Distortion	1/2"	+0.9% at 0.084X (y=4.0)
		+1.6% at 0.84X (y=4.0)
Back Focal Length	23.29mm	
Flange Back Length	17.526mm	
Mount	C-Mount	
Filter Size	M46 P=0.75mm	
Dimensions	φ 48mm x 98.5mm	
Weight	260g	

Working Distance (mm)	Optical Magnification	Field of View(mm)												
		1/2"			Magnification on Monitor	1/3"			Magnification on Monitor	1/4"			Magnification on Monitor	
		H	V	D		H	V	D		H	V	D		
150	Wide	0.084X	76.2	57.1	95.2	3.73X	57.1	42.9	71.4	4.98X	42.9	32.1	53.6	6.64X
	Middle	0.19X	33.5	25.2	42.3	8.47X	25.2	18.9	31.4	11.29X	18.9	14.2	23.6	15.06X
	Tele	0.84X	7.6	5.7	9.5	37.34X	5.7	4.3	7.1	49.78X	4.3	3.2	5.4	66.38X
200	Wide	0.06X	106.7	80.0	133.3	2.67X	80.0	60.0	100.0	3.56X	60.0	45.0	75.0	4.74X
	Middle	0.13X	47.8	36.1	59.4	5.87X	36.1	27.2	44.9	7.83X	27.2	20.4	33.9	10.44X
	Tele	0.60X	10.7	8.0	13.3	26.67X	8.0	6.0	10.0	35.56X	6.0	4.5	7.5	47.41X
250	Wide	0.045X	142.2	106.7	177.8	2.00X	106.7	80.0	133.3	2.67X	80.0	60.0	100.0	3.56X
	Middle	0.101X	62.3	47.1	77.0	4.49X	47.1	35.5	58.5	5.99X	35.5	26.7	44.2	7.98X
	Tele	0.45X	14.2	10.7	17.8	20.00X	10.7	8.0	13.3	26.67X	8.0	6.0	10.0	35.56X
300	Wide	0.036X	177.8	133.3	222.2	1.60X	133.3	100.0	166.7	2.13X	100.0	75.0	125.0	2.84X
	Middle	0.082X	76.8	58.2	94.8	3.63X	58.2	43.8	72.2	4.84X	43.8	33.0	54.6	6.46X
	Tele	0.36X	17.8	13.3	22.2	16.00X	13.3	10.0	16.7	21.34X	10.0	7.5	12.5	28.45X
350	Wide	0.03X	213.3	160.0	266.7	1.33X	160.0	120.0	200.0	1.78X	120.0	90.0	150.0	2.37X
	Middle	0.069X	91.4	69.3	112.7	3.05X	69.3	52.2	85.9	4.07X	52.2	39.3	65.0	5.42X
	Tele	0.30X	21.3	16.0	26.7	13.34X	16.0	12.0	20.0	17.78X	12.0	9.0	15.0	23.71X
400	Wide	0.025X	256.0	192.0	320.0	1.11X	192.0	144.0	240.0	1.48X	144.0	108.0	180.0	1.98X
	Middle	0.06X	106.0	80.3	130.7	2.63X	80.3	60.6	99.7	3.5X	60.6	45.6	75.4	4.67X
	Tele	0.25X	25.6	19.2	32.0	11.11X	19.2	14.4	24.0	14.82X	14.4	10.8	18.0	19.76X
450	Wide	0.022X	290.9	218.2	363.6	0.98X	218.2	163.6	272.7	1.30X	163.6	122.7	204.5	1.74X
	Middle	0.05X	120.7	91.5	148.7	2.31X	91.5	69.0	113.5	3.08X	69.0	51.9	85.9	4.1X
	Tele	0.22X	29.1	21.8	36.4	9.78X	21.8	16.4	27.3	13.04X	16.4	12.3	20.5	17.38X

Field of View : Horizontal (mm) x Vertical (mm) x Diagonal (mm)
 Monitor Magnification on 14inch Monitor
 Magnification on Monitor = Optical Magnification x Monitor Size / CCD Size



MEGAPIXEL MACRO ZOOM LENS

FACTORY AUTOMATION LENS

- Captures full resolution of megapixel cameras
- High contrast & sharp picture in all areas of the screen
- Compact design-Diameter 36.5mm
- Locking set screws for zoom, focus, and iris
- Low distortion
- High resolution macro zoom lens
- 3.3X magnification
- Attachment of fiber ring light can be installed (Ring Guide: M34 P=0.5)

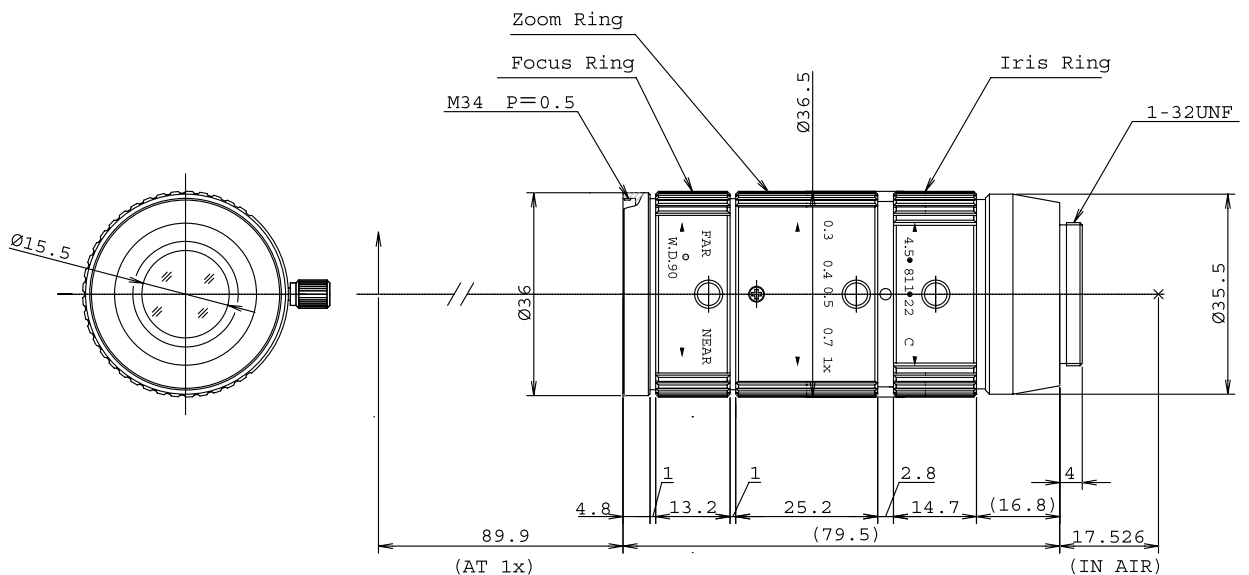
MLM-3XMP



Max. Magnification	0.3X - 1.0X			
Max. Aperture Ratio	1:4.5			
Max. Image Format	8.8mm x 6.6mm (φ 11mm)			
Operation Range	Iris	F4.5 - F22C		
	Focus	90mm		
Control	Iris	Manual		
	Focus	Manual		
	Zoom	Manual		
Angle of View	D	14.88° - 2.84°	10.70° - 2.72°	
	H	11.80° - 2.78°	8.48° - 2.18°	
	V	8.74° - 2.24°	6.38° - 1.64°	
Operating Temperature	-10° C ~ +50° C			
Distortion	2/3"	+0.12% at 0.3X (y=5.5) +1.78% at 1.0X (y=5.5)	1/2"	-0.12% at 0.3X (y=4.0) +0.77% at 1.0X (y=4.0)
Back Focal Length	20.4mm			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M34 P=0.5mm			
Dimensions	φ 36.5mm x 79.5mm			
Weight	150g			

Monitor Magnification on 14inch Monitor
Working Distance: 90mm
Magnification on Monitor = Optical Magnification x Monitor Size / CCD Size

Optical Magnification	Field of View(mm)											
	2/3"			Magnification on Monitor	1/2"			Magnification on Monitor	1/3"			Magnification on Monitor
	H	V	D		H	V	D		H	V	D	
0.3X	29.3	22.0	36.7	9.7X	21.3	16.0	26.7	13.3X	16.0	12.0	20.0	17.8X
0.4X	22.0	16.5	27.5	12.9X	16.0	12.0	20.0	17.8X	12.0	9.0	15.0	23.7X
0.5X	17.6	13.2	22.0	16.2X	12.8	9.6	16.0	22.2X	9.6	7.2	12.0	29.6X
0.6X	14.7	11.0	18.3	19.4X	10.7	8.0	13.3	26.7X	8.0	6.0	10.0	35.6X
0.7X	12.6	9.4	15.7	22.6X	9.1	6.9	11.4	31.1X	6.9	5.1	8.6	41.5X
0.8X	11.0	8.3	13.8	25.9X	8.0	6.0	10.0	35.6X	6.0	4.5	7.5	47.4X
0.9X	9.8	7.3	12.2	29.1X	7.1	5.3	8.9	40.0X	5.3	4.0	6.7	53.3X
1.0X	8.8	6.6	11.0	32.3X	6.4	4.8	8.0	44.5X	4.8	3.6	6.0	59.3X



5 MEGAPIXEL TELECENTRIC MACRO ZOOM LENS

FACTORY AUTOMATION LENS

TELECE
MACRO
ZOOM

- 5 megapixel resolution for a 1.1-inch sensor
- 7.1X magnification (0.5X - 0.07X)
- Relative Illumination rate is more than 70%

- Adjustable W.D. (182mm - 577.2mm)
- Telecentric design at 0.25X - 0.5X

NEW

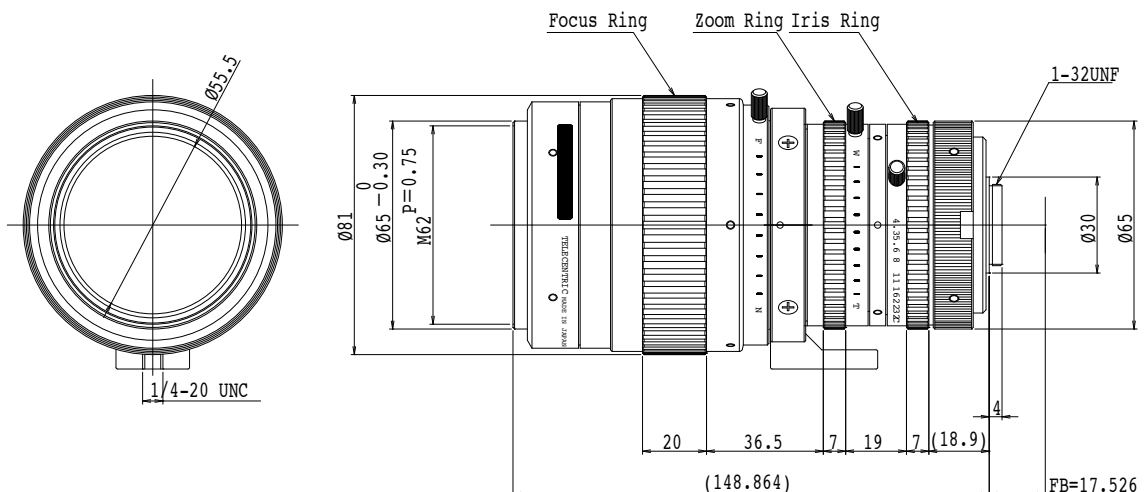
TEC-V7X



Optical Magnification	0.07X - 0.5X
Max. Aperture Ratio	1 : 4.3
Max. Image Format	12.3mm x 12.3mm (φ 17.4mm)
Operation Range	Iris F4.3 - F32
	Focus 182mm - 577.2mm
Control	Iris Manual operation
	Focus Manual operation
	Zoom Manual operation
Operating Temperature	-10° C ~ 50° C

Optical distortion	tele	1.0%	1"	0.84%	2/3"	0.39%
	wide	-1.7%		-1.45%		-0.7%
BackFocal Length	tele	39.53mm				
	wide	49.78mm				
Flange Back Length	17.526mm					
Mount	C Mount					
Filter Size	M62 x P0.75					
Dimensions	φ 61 x 152.86mm					
Weight	1.4kg					

Working Distance(mm)	Optical Magnification	Field of View(mm)									
		1.1"			1"			2/3"			
(mm)		H	V	D	H	V	D	H	V	D	
182	Wide	0.2525	48.74	48.74	69.12	50.32	38.06	63.28	34.88	26.16	43.6
	Middle	0.3643	33.64	33.64	47.33	34.72	26.3	43.6	24.12	18.1	30.11
	Tele	0.5	24.6	24.6	34.75	25.4	19.246	31.88	17.65	13.26	22
200	Wide	0.2258	54.52	54.62	76.94	56.3	42.56	70.84	39	29.24	48.76
	Middle	0.3258	37.62	37.62	52.95	38.83	29.4	48.78	26.96	20.24	33.67
	Tele	0.4451	27.5	27.5	38.68	28.38	21.51	35.64	19.72	14.81	24.62
300	Wide	0.1413	87.48	87.48	124.06	90.34	68.18	114.1	62.46	46.8	78.178
	Middle	0.2037	60.24	60.24	85.34	62.18	47.06	78.18	42.15	32.38	53.898
	Tele	0.2784	44	44	61.94	45.42	34.3	57.46	31.55	23.69	39.38
400	Wide	0.1037	119.47	119.47	169.98	123.4	93.02	156.05	85.2	63.82	106.71
	Middle	0.1495	82.15	82.15	115.97	84.8	64.16	106.72	58.82	44.12	73.48
	Tele	0.2042	59.99	59.99	84.52	61.92	46.89	77.82	43	32.28	53.7
500	Wide	0.082	151.25	151.25	215.44	156.25	117.67	197.8	107.78	80.68	135.04
	Middle	0.1183	103.92	103.92	146.82	107.28	81.12	135	74.37	55.78	92.94
	Tele	0.1617	75.84	75.84	106.89	78.29	59.28	98.4	54.36	40.8	67.88
577.5	Wide	0.0708	175.21	175.21	250.66	181.4	136.35	229.82	125.08	93.62	156.76
	Middle	0.102	120.57	120.57	170.44	124.47	94.1	156.74	86.28	64.72	107.84
	Tele	0.1398	87.99	87.99	124.04	90.8	68.75	114.16	63.06	47.32	78.74



5MP TELECENTRIC LENS

FACTORY AUTOMATION LENS

- Compact body design, compatible with 5MP sensors
- Optical magnification 0.057x - 0.5x

- Relative Illuminance more than 80%
- Low distortion, less than 1%

NEW

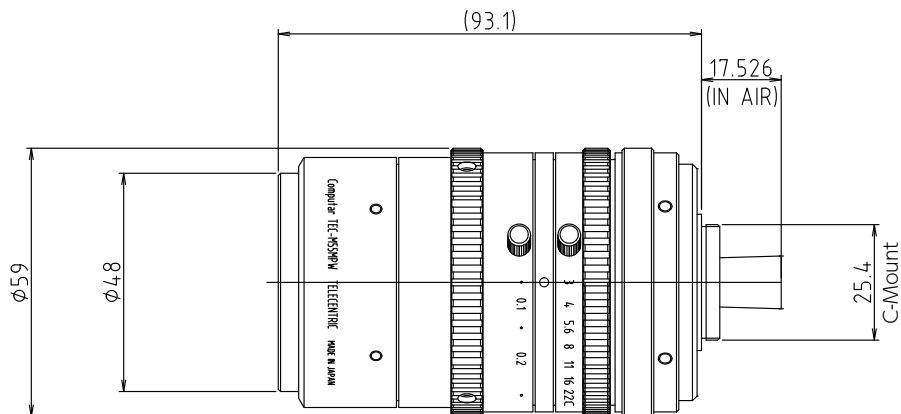
TEC-M55MPW



Focal length	55mm (at 0.057X) 51mm (at 0.5X)
Max Aperture Ratio	1:3.0
Max. Image Format	8.8mm x 6.6mm (φ11mm)
Operation Iris Range	F3.0-F22C
Focus	139mm - 1000mm
Magnification	0.057x - 0.5x
Relative Illumination	94% (at 0.057x) 81% (at 0.5x)
Control Iris	Manual
Focus	Manual
Object Dimension at M.O.D	17(H)mm x 1.3(V)mm 2/3"
Operation Temperature	-10° C ~ 50° C

Distortion	2/3"	+0.52% at 0.057x (y=5.5)
		+0.6% at 0.5x (y=5.5)
Back focal length	17.0mm	
Flange Back Length	17.526mm	
Mount	C-Mount	
Filter Size	Focal length	
Dimensions	φ59.0mm x 93.1mm	
Weight	470g	

Working Distance(mm)	Optical Magnification (X)	Field of View(mm)					
		2/3"		1/2"		1/3"	
		H	V	H	V	H	V
1000	0.057	154.4	115.8	112.3	84.2	84.2	63.2
950	0.060	146.7	110.0	106.7	80.0	80.0	60.0
900	0.064	137.5	103.1	100.0	75.0	75.0	56.3
850	0.067	131.3	98.5	95.5	71.6	71.6	53.7
800	0.072	122.2	91.7	88.9	66.7	66.7	50.0
750	0.077	114.3	85.7	83.1	62.3	62.3	46.8
700	0.083	106.0	79.5	77.1	57.8	57.8	43.4
650	0.089	98.9	74.2	71.9	53.9	53.9	40.4
600	0.097	90.7	68.0	66.0	49.5	49.5	37.1
550	0.106	83.0	62.3	60.4	45.3	45.3	34.0
500	0.118	74.6	55.9	54.2	40.7	40.7	30.5
450	0.132	66.7	50.0	48.5	36.4	36.4	27.3
400	0.150	58.7	44.0	42.7	32.0	32.0	24.0
350	0.173	50.9	38.2	37.0	27.7	27.7	20.8
300	0.204	43.1	32.4	31.4	23.5	23.5	17.6
250	0.251	35.1	26.3	25.5	19.1	19.1	14.3
200	0.323	27.2	20.4	19.8	14.9	14.9	11.1
150	0.456	19.3	14.5	14.0	10.5	10.5	7.9
140	0.504	17.5	13.1	12.7	9.5	9.5	7.1



TELECENTRIC LENS

FACTORY AUTOMATION LENS



- Very low distortion compared to standard macro lens
- Wide depth of field
- Working distance: 140mm - Infinity
- Suitable for use as a telephoto lens and macro lens
- Fast F2.8 F-stop at Infinity

TEC-M55



Focal Length	55mm
Max. Aperture Ratio	1:2.8
Max. Image Format	8.8mm x 6.6mm (φ 11mm)
Operation Range	Iris F2.8 - F32C Focus 0.14m - Inf.
Magnification	Inf. - 0.5X (Max 1.0X at 140mm with 2X Converter)
Relative Illumination	78.5% (at 0.5X)
Depth of Field	1/2" 3.5mm(at 0.5X F2.8), 6.0mm(at 0.5X F5.6)
Control	Iris Manual Focus Manual
Object Dimension at M.O.D	1.7(H)cm x 1.3(V)cm 2/3"
Operating Temperature	-10° C ~ +50° C

Distortion	2/3"	+0.2% at 0.2X (y=5.5)	1/2"	+0.1% at 0.2X (y=4.0)
		+0.6% at 0.5X (y=5.5)		+0.3% at 0.5X (y=4.0)
Back Focal Length	29.8mm			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M43 P=0.75mm			
Dimensions	φ 53.0mm x 92.9mm (Max. at 0.5X)			
Weight	320g			

TEC-M55

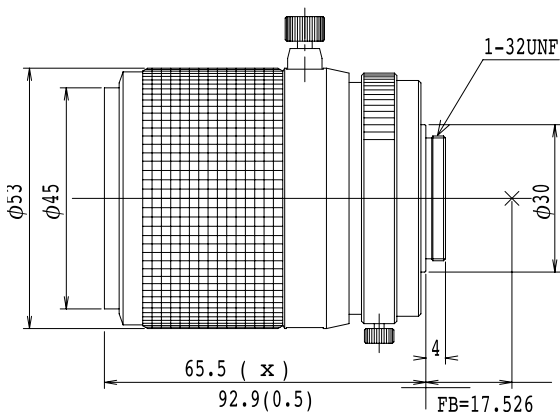
Working Distance (mm)	Optical Magnification	Field of View(mm)					
		2/3"		1/2"		1/3"	
		H	V	H	V	H	V
5000	0.011X	796.2	597.8	579.7	435.0	435.0	326.3
4000	0.014X	636.1	477.6	463.1	347.5	347.5	260.7
3000	0.018X	476.0	357.4	346.6	260.1	260.1	195.1
2000	0.028X	315.9	237.2	230.0	172.6	172.6	129.5
1500	0.037X	235.9	177.1	177.1	128.9	128.9	96.7
1000	0.056X	155.8	117.0	113.4	85.1	85.1	63.9
950	0.059X	147.8	111.0	107.6	80.7	80.7	60.6
900	0.063X	139.8	105.0	101.8	76.4	76.4	57.3
850	0.067X	131.8	99.0	96.0	72.0	72.0	54.0
800	0.071X	123.8	92.9	90.1	67.6	67.6	50.7
750	0.076X	115.8	86.9	84.3	63.2	63.2	47.4
700	0.081X	107.8	80.9	78.5	58.9	58.9	44.2
650	0.088X	99.8	74.9	72.6	55.5	54.5	40.9
600	0.096X	91.8	68.9	66.8	50.1	50.1	37.6
550	0.105X	83.8	62.9	61.0	45.8	45.8	34.3
500	0.116X	75.8	56.9	55.2	41.4	41.4	31.0
450	0.130X	67.8	50.9	49.3	37.0	37.0	27.8
400	0.147X	59.8	44.9	43.5	32.6	32.6	24.5
350	0.170X	51.8	38.8	37.7	28.3	28.3	21.2
300	0.201X	43.8	32.8	31.8	23.9	23.9	17.9
250	0.246X	35.7	26.8	26.0	19.5	19.5	14.6
200	0.317X	27.7	20.8	20.2	15.1	15.1	11.4
150	0.446X	19.7	14.8	14.3	10.8	10.8	8.1
140	0.486X	18.1	13.6	13.2	9.9	9.9	7.4

TEC-M55 with 0.75X Converter

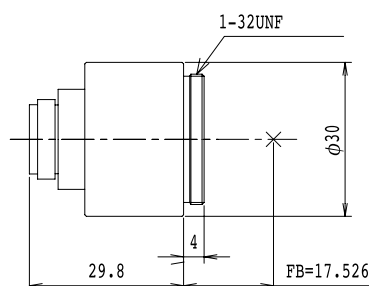
Working Distance (mm)	Optical Magnification	Field of View(mm)					
		2/3"		1/2"		1/3"	
		H	V	H	V	H	V
5000	0.008X	1066.2	797.6	773.3	579.2	579.2	434.0
4000	0.010X	851.9	637.3	617.8	462.7	462.7	346.8
3000	0.014X	637.6	476.9	462.4	346.3	346.3	259.5
2000	0.021X	423.2	316.6	306.9	229.9	229.9	172.3
1500	0.028X	316.1	236.4	229.2	171.7	171.7	128.6
1000	0.423X	208.9	156.2	151.5	113.4	113.4	85.0
950	0.045X	198.2	148.2	143.7	107.6	107.6	80.6
900	0.047X	187.4	140.2	135.9	101.8	101.8	76.3
850	0.050X	176.7	132.2	128.1	96.0	96.0	71.9
800	0.053X	166.0	124.2	120.4	90.1	90.1	67.5
750	0.057X	155.3	116.1	112.6	84.3	84.3	63.2
700	0.061X	144.6	108.1	104.8	78.5	78.5	58.8
650	0.066X	133.8	100.1	97.0	72.7	72.7	54.5
600	0.072X	123.1	92.1	89.3	66.8	66.8	50.1
550	0.079X	112.4	84.1	81.5	61.0	61.0	45.7
500	0.087X	101.7	76.0	73.7	55.2	55.2	41.4
450	0.097X	90.9	68.0	65.9	49.4	49.4	37.0
400	0.110X	80.2	60.0	58.2	43.6	43.6	32.6
350	0.127X	69.5	52.0	50.4	37.7	37.7	28.3
300	0.151X	58.7	43.9	42.6	31.9	31.9	23.9
250	0.184X	48.0	35.9	34.8	26.1	26.1	19.5
200	0.238X	37.3	27.9	27.0	20.2	20.2	15.2
150	0.334X	26.5	19.8	19.2	14.4	14.4	10.8
140	0.363X	24.4	18.2	17.7	13.2	13.2	9.9

TEC-M55 with 2X Converter

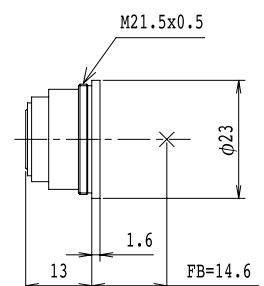
Working Distance (mm)	Optical Magnification	Field of View(mm)					
		2/3"		1/2"		1/3"	
		H	V	H	V	H	V
5000	0.019X	453.1	340.3	330.0	247.7	247.7	185.8
4000	0.024X	362.0	271.9	263.6	197.9	197.9	148.5
3000	0.032X	270.9	203.4	197.3	148.1	148.1	111.1
2000	0.049X	179.8	135.0	130.9	98.3	98.3	73.7
1500	0.065X	134.3	100.8	97.8	73.4	73.4	55.0
1000	0.098X	88.7	66.6	64.6	48.5	48.5	36.4
950	0.104X	84.1	63.2	61.3	46.0	46.0	34.5
900	0.110X	79.6	59.8	58.0	43.5	43.5	32.6
850	0.116X	75.0	56.3	54.6	41.0	41.0	30.8
800	0.124X	70.5	52.9	51.3	38.5	38.5	28.9
750	0.133X	65.9	49.5	48.0	36.0	36.0	27.0
700	0.142X	61.4	46.1	44.7	33.5	33.5	25.2
650	0.154X	56.8	42.7	41.4	31.0	31.0	23.3
600	0.167X	52.3	39.2	38.1	28.6	28.6	21.4
550	0.183X	47.7	35.8	34.7	26.1	26.1	19.6
500	0.203X	43.2	32.4	31.4	23.6	23.6	17.7
450	0.227X	38.6	29.0	28.1	21.1	21.1	15.8
400	0.257X	34.0	25.6	24.8	18.6	18.6	14.0
350	0.297X	29.5	22.1	21.5	16.1	16.1	12.1
300	0.352X	24.9	18.7	18.2	13.6	13.6	10.2
250	0.431X	20.4	15.3	14.8	11.1	11.1	8.4
200	0.558X	15.8	11.9	11.5	8.7	8.7	6.5
150	0.789X	11.3	8.5	8.2	6.2	6.2	4.6
140	0.861X	10.4	7.8	7.6	5.7	5.7	4.3



2X Converter



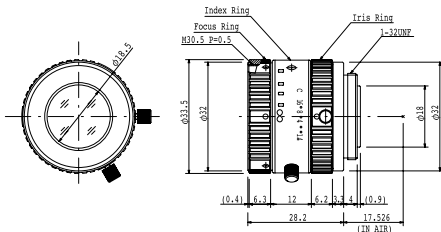
0.75X Converter



- Designed for for SWIR (800-1700nm) range
- Compact & Light weight

- Low F-stop
- Covers 640 x 512, 15µm Sensor

M1614-SW

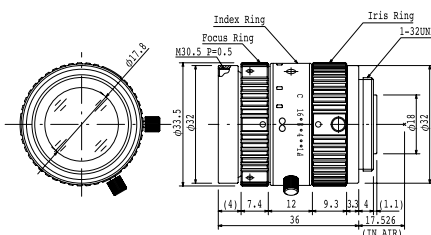


Focal Length	16mm			
Max. Aperture Ratio	1:1.4			
Max. Image Circle	φ 12.3mm			
Operation Range	Iris	F1.4 - F16C		
	Focus	0.3m - Inf.		
Control	Iris	Manual		
	Focus	Manual		
Object Dimension at M.O.D.	17.0(H)cm x 12.7(V)cm 2/3"			
Angle of View	D		37.7°	27.9°
	H	2/3"	30.6°	22.5°
	V		23.2°	16.9°
Operating Temperature	-10° C ~ +50° C			

Distortion	2/3"	-0.5% (y=5.5)	1/2"	-0.5% (y=4.0)
Back Focal Length	13.3mm (Inf)			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M30.5 P=0.5mm			
Dimensions	φ 33.5mm x 28.2mm			
Weight	60g			

Angle of View (InGaAs Detector)	D	640 x 512 (Pixel Pitch : 15µm)	41.7°	320 x 256 (Pixel Pitch : 25µm)	35.3°	320 x 256 (Pixel Pitch : 20µm)	28.6°
	H	H9.60mm x V7.68mm	33.2°	H8.00mm x V6.40mm	27.9°	H6.40mm x V5.12mm	22.5°
	V		26.8°		22.5°		18.0°

M2514-SW



Focal Length	25mm			
Max. Aperture Ratio	1:1.4			
Max. Image Circle	φ 12.3mm			
Operation Range	Iris	F1.4 - F16C		
	Focus	0.3m - Inf.		
Control	Iris	Manual		
	Focus	Manual		
Object Dimension at M.O.D.	10.5(H)cm x 7.8(V)cm 2/3"			
Angle of View	D		24.7°	18.1°
	H	2/3"	19.8°	14.5°
	V		14.9°	10.9°
Operating Temperature	-10° C ~ +50° C			

Distortion	2/3"	-0.5% (y=5.5)	1/2"	-0.2% (y=4.0)
Back Focal Length	13.4mm (Inf)			
Flange Back Length	17.526mm			
Mount	C-Mount			
Filter Size	M30. 5 P=0.5mm			
Dimensions	φ 33.5mm x 36.0mm			
Weight	71.2g			

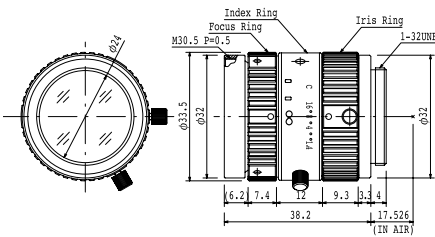
Angle of View (InGaAs Detector)	D	640 x 512 (Pixel Pitch : 15µm)	27.6°	320 x 256 (Pixel Pitch : 25µm)	23.0°	320 x 256 (Pixel Pitch : 20µm)	18.5°
	H	H9.60mm x V7.68mm	21.6°	H8.00mm x V6.40mm	18.1°	H6.40mm x V5.12mm	14.5°
	V		17.3°		14.5°		11.6°



- Designed for for SWIR (800-1700nm) range
- Compact & light weight

- Low F-stop
- Covers 640 x 512, 15µm sensor

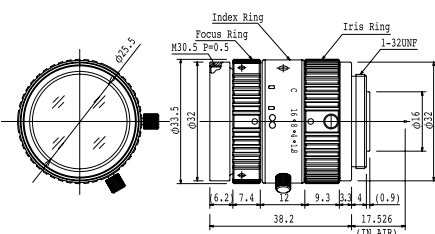
M3514-SW



Focal Length	35mm		Distortion	2/3"	-0.1% (y=5.5)	1/2"	-0% (y=4.0)
Max. Aperture Ratio	1:1.4		Back Focal Length	14.6mm			
Max. Image Circle	φ 12.3mm		Flange Back Length	17.526mm			
Operation Range	Iris	F1.4 - F16C	Mount	C-Mount			
	Focus	0.3m - Inf.	Filter Size	M30.5 P=0.5mm			
Control	Iris	Manual	Dimensions	φ 33.5mm x 38.2mm			
	Focus	Manual	Weight	87g			
Object Dimension at M.O.D.	8.0(H)cm x 6.0(V)cm 2/3"						
Angle of View	D		18.4°				13.4°
	H	2/3"	14.7°	1/2"			10.7°
	V		11.1°				8.1°
Operating Temperature	-10° C ~ +50° C						

Angle of View (InGaAs Detector)	D	640 x 512	20.5°	320 x 256	17.1°	320 x 256	13.7°
	H	(Pixel Pitch : 15µm)	16.0°	(Pixel Pitch : 25µm)	13.4°	(Pixel Pitch : 20µm)	10.7°
	V	H9.60mm x V7.68mm	12.9°	H8.00mm x V6.40mm	10.7°	H6.40mm x V5.12mm	8.6°

M5018-SW



Focal Length	50mm		Distortion	2/3"	-0.3% (y=5.5)	1/2"	-0.1% (y=4.0)
Max. Aperture Ratio	1:1.8		Back Focal Length	13.6mm			
Max. Image Circle	φ 12.3mm		Flange Back Length	17.526mm			
Operation Range	Iris	F1.8 - F16C	Mount	C-Mount			
	Focus	0.6m - Inf.	Filter Size	M30.5 P=0.5mm			
Control	Iris	Manual	Dimensions	φ 33.5mm x 38.2mm			
	Focus	Manual	Weight	85g			
Object Dimension at M.O.D.	10.4(H)cm x 7.8(V)cm 2/3"						
Angle of View	D		13.0°				9.5°
	H	2/3"	10.4°	1/2"			7.6°
	V		7.8°				5.7°
Operating Temperature	-10° C ~ +50° C						

Angle of View (InGaAs Detector)	D	640 x 512	14.5°	320 x 256	12.1°	320 x 256	9.7°
	H	(Pixel Pitch : 15µm)	11.3°	(Pixel Pitch : 25µm)	9.5°	(Pixel Pitch : 20µm)	7.6°
	V	H9.60mm x V7.68mm	9.1°	H8.00mm x V6.40mm	7.6°	H6.40mm x V5.12mm	6.1°

5MP Lens for ITS

INTELLIGENT TRANSPORT SYSTEM LENS

- 3-Iris type. Manual, DC and P-iris
- Wide Variety range, 9mm, 12mm, 16mm, 25mm

- High resolution for 5MP sensors

MG0918KC-MP



MG1218KC-MP



MG1616KC-MP



MG2514KC-MP



ITS LENSES

	Model Name	Format	Mount	Focal length (mm)	Aperture (F)
Manual Iris	M0918FIC-MP	2/3	C	9	1.8-16C
	M1218FIC-MP	2/3	C	12	1.8-16C
	M1616FIC-MP	2/3	C	16	1.6-16C
	M2514FIC-MP	2/3	C	25	1.4-16C
DC Iris	MG0918FC-MP	2/3	C	9	1.8-360C
	MG1218FC-MP	2/3	C	12	1.8-360C
	MG1616FC-MP	2/3	C	16	1.6-360C
	MG2514FC-MP	2/3	C	25	1.4-360C
P Iris	MG0918KC-MP	2/3	C	9	1.8-16C
	MG1218KC-MP	2/3	C	12	1.8-16C
	MG1616KC-MP	2/3	C	16	1.6-16C
	MG2514KC-MP	2/3	C	25	1.4-16C

M0918FIC-MP



M1218FIC-MP



M1616FIC-MP



M2514FIC-MP



5MP Lens for ITS (IR Compatible)

INTELLIGENT TRANSPORT SYSTEM LENS



- 3-Iris type. Manual, DC and P-iris
- Compatible with CMOSIS sensor "CMV2000"

- High resolution for 5MP sensors
- IR Compatible

M2514FIC-MPIR



M3518FIC-MPIR



M5020FIC-MPIR



MG2514KC-MPIR



MG3518KC-MPIR



MG5020KC-MPIR



ITS LENSES

	Model Name	Format	Mount	Focal length (mm)	Aperture (F)
Manual Iris	M2514FIC-MPIR	2/3	C	25	1.4-16C
	M3518FIC-MPIR	2/3	C	35	1.9-16C
	M5020FIC-MPIR	2/3	C	50	2.0-16C
DC Iris	M2514FC-MPIR	2/3	C	25	1.4-360C
	MG3518FC-MPIR	2/3	C	35	1.8-360C
	MG5020FC-MPIR	2/3	C	50	2.0-360C
P Iris	M2514KC-MPIR	2/3	C	25	1.4-16C
	MG3518KC-MPIR	2/3	C	35	1.8-16C
	MG5020KC-MPIR	2/3	C	50	2.0-16C



MEGAPIXEL BOARD LENSES

FACTORY AUTOMATION LENS

- 1/2" sensor
- M12, P0.5 mount

- Tough and compact design



1. H0320KP



2. H0624KP



3. H0924KP



4. H1620KP



5. H2520KP

Megapixel Board Lenses

No.	Model Name	Format Inch	Mount	Pitch	Focal Length(mm)	Aperture (F)	Distortion	Angle of view at INF(degrees)			Angle of view at INF(degrees)			Angle of view at INF(degrees)			Iris	
								1/2"			1/3"			1/4"			No Iris	Manual
								D	H	V	D	H	V	D	H	V		
1	H0320KP	1/2	M12	0.5	3mm	F2.0	-37.5%	125.3	104.3	80.5	98.6	80.5	61.3	75.8	61.3	46.3	○	
2	H0624KP	1/2	M12	0.5	6mm	F2.4	-9.0%	72.5	59.1	45.0	55.6	45.0	34.0	42.3	34.0	25.6	○	
3	H0924KP	1/2	M12	0.5	9mm	F2.4	-1.6%	48.6	39.6	30.1	37.3	30.1	22.7	28.3	22.7	17.1	○	
4	H1620KP	1/2	M12	0.5	16mm	F2.0	0.4%	27.9	22.6	17.0	21.2	17.0	12.8	16.0	12.8	9.6	○	
5	H2520KP	1/2	M12	0.5	25mm	F2.0	1.0%	18.0	14.5	10.9	13.6	10.9	8.2	10.3	8.2	6.2	○	

3 MEGAPIXEL ULTRA LOW DISTORTION BOARD LENSES

FACTORY AUTOMATION LENS

- Ultra low distortion (optical distortion 0.1% or less)
- 1/1.8" sensor
- M12, P0.5 mount

- Tough and compact design
- Optional F stop

*Quantity commitment is necessary



1. E1220KV



2. E1620KV



3. E2520KV



3 Megapixel Board Lenses

No.	Model Name	Format Inch	Mount	Pitch	Focal Length(mm)	Aperture (F)	Distortion	Angle of view at INF(degrees)			Angle of view at INF(degrees)			Angle of view at INF(degrees)			Iris	
								1/1.8"			1/2"			1/3"			No Iris	Manual
								D	H	V	D	H	V	D	H	V		
1	E1220KV	1/1.8	M12	0.5	12.0mm	F2.0	0.04%	39.5	32.1	24.4	36.8	29.8	22.6	28.1	22.6	17.1	○	
2	E1620KV	1/1.8	M12	0.5	16.0mm	F2.0	-0.07%	30.0	24.3	18.4	27.9	22.6	17.0	21.2	17.0	12.8	○	
3	E2520KV	1/1.8	M12	0.5	25.0mm	F2.0	0.02%	19.5	15.7	11.9	18.1	14.6	11.0	13.7	11.0	8.2	○	

MEGAPIXEL FISHEYE BOARD LENS

FACTORY AUTOMATION LENS

MEGAPIXEL BOARD



H1328KP

Megapixel Fisheye Board Lens

No.	Model Name	Format inch	Mount	Pitch	Focal Length(mm)	Aperture (F)	Distortion	Angle of view at INF(degrees)			Angle of view at INF(degrees)			Angle of view at INF(degrees)			Iris	
								1/2"			1/3"			1/4"			No Iris	Manual
								D	H	V	D	H	V	D	H	V		
1	H1328KP	1/2	M12	0.5	1.3mm	F2.8	-99.4%	180.0	180.0	151.0	177.3	151.0	117.6	○				

Image for angle of view for 1/2" Fisheye Board Lens

1/2"			1/3"			1/4"			
D	H	V	D	H	V	D	H	V	
180.0			180.0			151.0	177.3	151.0	117.6

Rectangles show CCD size and image area on a monitor.

5 Megapixel Fisheye Board Lens



L1028KRW L1028KDRW

No.	Model Name	Format inch	Mount	Pitch	Focal Length(mm)	Aperture (F)	Distortion	Angle of view at INF(degrees)			Angle of view at INF(degrees)			Angle of view at INF(degrees)			Iris	Water Proof
								1/2.5"			1/3"			1/4"				
								D	H	V	D	H	V	D	H	V		
1	L1028KRW	1/2.5"	M12	0.5	1.05mm	F2.8	-96.66%	180.0	180.0	163.2	180.0	163.2	130.2	○				
2	L1028KDRW	1/2.5"	M12	0.5	1.05mm	F2.8	-96.66%	180.0	180.0	163.2	180.0	163.2	130.2	○	○			

FEATURES OF H1328KP

H1328KP is 180° wide angle lens with megapixel resolution. Compared with a standard fisheye lens, H1328KP has less distortion and compression at corner, and is easy to recognize objects.

For wide area surveillance or teleconference system

Fisheye Lens f=1.3mm (angle 180°)



view of standard wide angle lens

Standard wide angle lens f=3.3mm (horizontal angle 104.3°)



For internal inspection of pipe and container

H1328KP has large depth of field and is suitable for internal inspection of pipe or container. This megapixel lens can also be used with high resolution cameras.



sample of pipe inspection

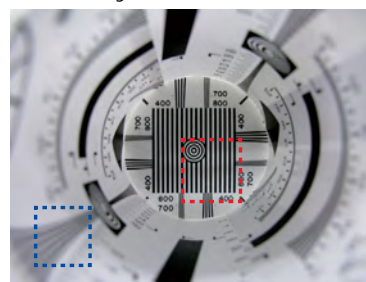


Image at center

Fisheye Lens



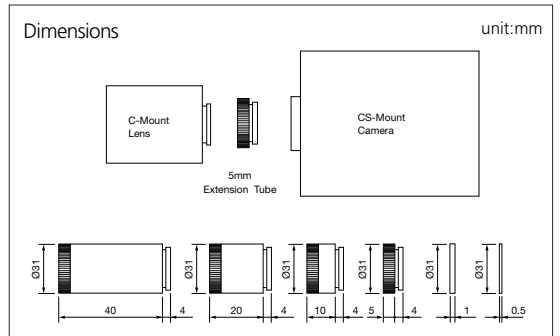
Standard wide angle lens



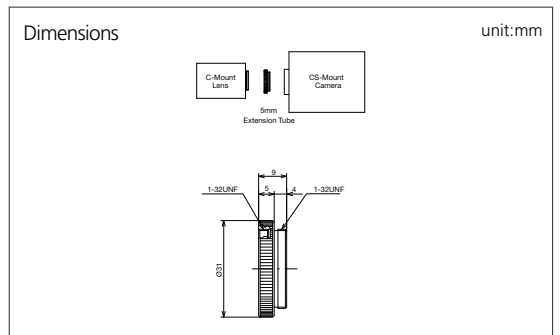
A standard wide angle lens has a focal point only at **center**, and the **corners** are usually out of focus. It is difficult to have the best performance in both the **center** and **corner** at the same time. However, H1328KP provides a vivid picture in both **center** and **corners**.



MODEL NO.	VM100
Description	Extension Tube Kit 40, 20, 10, 5, 1, 0.5mm
Application	Attached between lens and camera - Reduces minimum focusing distance



MODEL NO.	VM400
Description	5mm Adapter Ring
Application	Attached between lens and camera - Adapts C-mount lens to CS-mount camera



MODEL NO.	EX1.5CS
Description	1.5X Extender for CS-mount
Application	Attached between lens and camera - Makes focal length 1.5X



MODEL NO.	EX1.5C
Description	1.5X Extender for C-mount
Application	Attached between lens and camera - Makes focal length 1.5X



MODEL NO.	EX2CS
Description	2X Extender for CS-mount
Application	Attached between lens and camera - Makes focal length 2X



MODEL NO.	EX2C
Description	2X Extender for C-mount
Application	Attached between lens and camera - Makes focal length 2X



1. Calculation of Working Distance (WD)

Distance from lens to object (WD) is calculated by putting the size of a camera's imaging device, focal length and an object size into the following formula.

<Formula>
 $WD = H1 + y \times f / y'$

[Ex]
 When 2/3" camera with M2514-MP films an object whose vertical size is 120 mm.
 f : 25 mm
 H1 : 26.77mm
 y : 120mm
 y' : 6.6mm

Distance from lens to object=
 $WD = 26.77 + 120 \times 25 / 6.6 = 481.32 \text{ mm}$

2. Calculation of Focal Length

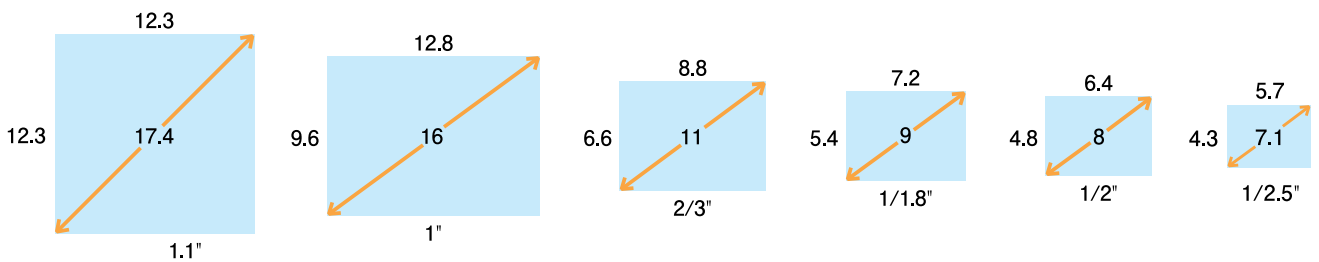
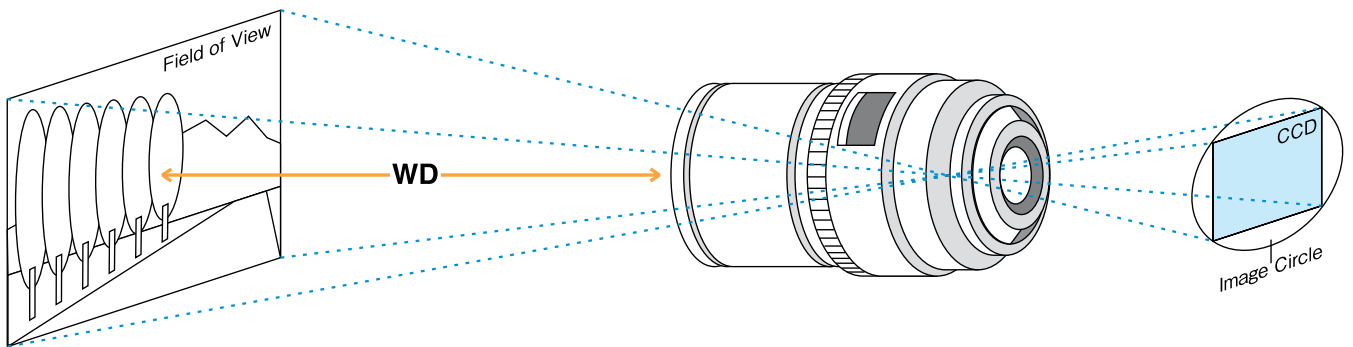
When choosing size of a camera's imaging device, the object size and WD are fixed, focal length can be calculated by the following formula. You can select appropriate lens from the focal length.

<Formula>
 $f = y' \times WD / y$

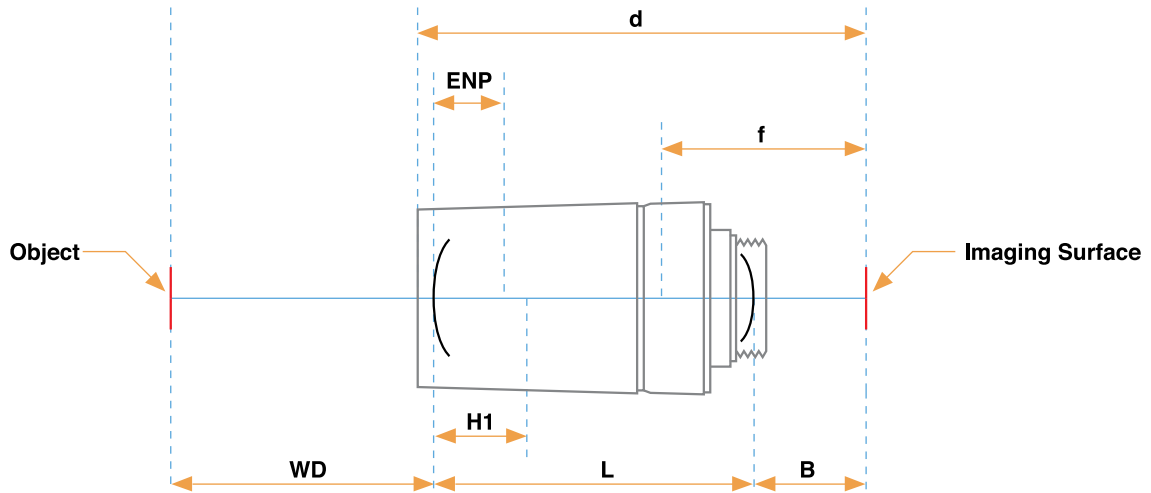
f = focal length of lens
 WD = distance from lens to object
 H1 : first principal point
 y : vertical size of object
 y' : vertical size of camera's imaging device

CAMERA FORMAT

The size of camera's imaging device also affects the angle of view, with the smaller devices creating narrower angles of view when used on the same lens. The format of the lens, however is irrelevant to the angle of view, it merely needs to project an image which will cover the device, i.e.; the same format of the camera or larger. This also means that 1/3" cameras can utilize the entire range of lenses from 1/3" to 2/3", with a 1/3" 8mm lens giving the same angle as a 2/3" 8mm lens. The latter combination also provides increased resolution and picture quality as only the centre of the lens is being utilized, where the optics can be ground more accurately.



OPTICAL DATA



		Focal Length	First Principal Point	Total Length	Back Focus	Entrance Pupil Diameter	Entrance Pupil Position	Distortion	Extension	Length
		f	H1	L	B		ENP	%		d
MEGAPIXEL MACRO ZOOM LENS										
MLM-3XMP	Wide	30.2	30.2	61.6	20.5	9.5	38.9	0.4	-	97.0
	Tele	29.1	44.7	61.6	20.5	61.4	313.8	2.3	-	97.0
MEGAPIXEL VARI-FOCAL LENS										
M3Z1228C-MP	Wide	12.0	36.2	53.3	14.7	4.3	25.6	-2.6	-	70.5
	Tele	36.0	95.3	54.5	13.4	12.7	68.4	3.5	-	70.5
MEGAPIXEL FIXED FOCAL LENS										
5 MEGAPIXEL										
M2518-MPW		25.0	27.4	27.1	13.9	13.9	20.8	0.03	6.2	61.7
M5028-MPW2		50.0	7.4	27.8	27.7	17.9	21.3	0.03	7.3	58.9
M3520-MPW2		35.0	14.0	25.7	18.0	17.5	20.4	0.01	7.3	50.9
M2518-MPW2		25.0	27.4	28.3	13.8	13.9	20.8	0.03	4.3	49.0
M1620-MPW2		16.0	23.9	27.9	14.7	8.0	15.8	0.09	3.3	47.0
M1224-MPW2		12.0	23.5	39.0	14.4	5.1	16.0	-0.02	1.75	58.0
M0824-MPW2		8.0	20.0	42.4	13.7	3.4	13.5	-1.87	-0.3	59.0
MEGAPIXEL										
M7528-MP		72.6	111.5	55.2	13.7	24.8	47.8	0.2	15.5	71.0
M5018-MP2		48.0	22.1	40.9	13.1	25.9	52.8	-0.3	4.8	55.6
M3514-MP		34.0	43.7	37.6	15.2	24.0	37.3	-0.3	4.9	55.7
M2514-MP2		25.0	23.8	29.3	13.1	17.5	12.8	-0.3	2.0	53.5
M1614-MP2		16.0	26.2	29.7	13.1	11.2	14.3	-0.1	0.8	45.7
M1214-MP2		12.0	24.7	28.7	13.1	8.4	17.7	0.1	0.4	45.7
M0814-MP2		8.3	19.5	30.7	13.1	5.8	12.4	-0.1	0.2	45.7
H0514-MP2		5.1	20.2	50.5	10.8	3.5	15.0	-0.7	0.1	63.0
TELECENTRIC LENS										
TEC-M55		54.8	27.8	47.3	31.4	20.1	75.1	0.4	27.4	83.0
TEC-M55 with x0.75		41.2	51.6	64.0	14.7	19.8	73.8	-0.9	27.4	83.0
TEC-M55 with x2.0		95.7	83.7	68.8	24.9	19.8	73.8	0.4	27.4	83.0
TEC-M55MPW		55.0	17.3	67.6	17.0	19.6	71.4	0.52	-	110.6
MACRO ZOOM LENS										
MLH-10X (0.15m Wide)		18.8	91.3	87.2	23.4	3.8	3.8	2.5	-	116.0
MLH-10X (0.15m Tele)		68.7	-0.1	87.2	23.4	20.1	20.1	2.9	-	116.0
5 MEGAPIXEL TELECENTRIC MACRO ZOOM LENS										
TEC-V7X	Wide	106.3	-136.1	122.4	39.5	53.6	375.0	1.0	-	166.4
	Tele	47.7	-143.1	112.1	49.8	11.0	126.9	-1.7	-	166.4

* First principal point and entrance pupil position are calculated from front lens

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