



Quality of Light

INDUSTRIAL FA LENSES

2017 Ver.1.0



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Technology

Function

Performance

Note: Specifications and availability are subject to change without notice.

INDUSTRIAL FA LENSES



Function Icons

- | | | | | |
|--|--|--|--------------------------------------|----------------------------------|
| FIXED Fixed Focal Lens | VARI Varifocal Lens | ZOOM Manual Zoom Lens | 4/3" 4/3 Inch Format Lens | |
| 21MEGA Lens for 21 Megapixel Camera | 10MEGA Lens for 10 Megapixel Camera | 8MEGA Lens for 8 Megapixel Camera | 1" 1 Inch Format Lens | |
| 6MEGA+ Lens for 6 Megapixel Plus Camera | 5MEGA+ Lens for 5 Megapixel Plus Camera | 5MEGA Lens for 5 Megapixel Camera | 2/3" 2/3 Inch Format Lens | |
| 3MEGA Lens for 3 Megapixel Camera | MEGA Lens for Megapixel Camera | 3CCD Lens for 3CCD Camera | 1/1.8" 1/1.8 Inch Format Lens | |
| C-mt C-mount Lens | NF-mt NF-mount Lens | METAL Lens with Metal Body | RUGGED Ruggedized lens | 1/2" 1/2 Inch Format Lens |
| FLOAT Floating Mechanism Design | DIS-F Distortion Free | LO-DIS Low Distortion | 1/3" 1/3 Inch Format Lens | |
| XD Extra Low Dispersion | IR Infrared | | fmm Focal Length (mm) | |

04	4/3" 8 MEGAPIXEL XC SERIES	LM8XC LM12XC LM16XC LM25XC LM35XC LM50XC
06	1" 6 MEGAPIXEL PLUS SC SERIES	LM12SC LM16SC LM25SC LM35SC LM50SC
08	1" MEGAPIXEL HC SERIES	LM8HC LM8HC LM12HC LM16HC LM25HC LM35HC LM50HC LM75HC
NEW 10	1" RUGGEDIZED MEGAPIXEL HC-V SERIES	LM8HC-V LM12HC-V LM16HC-V LM25HC-V LM35HC-V LM50HC-V
12	2/3" 10 MEGAPIXEL JC10M SERIES	LM5JC10M LM8JC10M LM12JC10M LM16JC10M LM25JC10M LM35JC10M LM50JC10M
14	2/3" 5 MEGAPIXEL JC5M2 SERIES	LM12JC5M2 LM16JC5M2 LM25JC5M2 LM35JC5M2
NEW 16	2/3" 3 MEGAPIXEL JC3M2 SERIES	LM8JC3M2 LM12JC3M2 LM16JC3M2 LM25JC3M2 LM35JC3M2 LM50JC3M2
18	WIDE MEGAPIXEL	LM3NCM LM4NCM LM6NCM LM5JCM
20	2/3" MEGAPIXEL JCM SERIES	LM8JCM LM12JCM LM16JCM LM25JCM LM35JCM LM50JCM
22	2/3" RUGGEDIZED MEGAPIXEL JCM-V SERIES	LM8JCM-V LM12JCM-V LM16JCM-V LM25JCM-V LM35JCM-V LM50JCM-V
24	2/3" STANDARD JC SERIES	LM6JC LM8JC LM12JC LM16JC LM25JC LM35JC LM50JC LM75JC LM100JC
25	1/1.8" STANDARD NCL SERIES	LM4NCL LM5NCL LM6NCL LM12NCL
26	1" SWIR MEGAPIXEL HC-SW SERIES	LM8HC-SW LM12HC-SW LM16HC-SW LM25HC-SW LM35HC-SW LM50HC-SW
NEW 28	NIR & DAY/NIGHT SERIES	LM16JCSM-IR LM25JCSM-IR LM35JCSM-IR LM50HC-IR LM60HC-IR LM50-IR LM65-IR
30	LINE SCAN LF SERIES	LM28LF LM35LF LM50LF
30	3CCD LARGE FORMAT CLS SERIES	LM28CLS LM35CLS LM50CLS
31	1/3" NF-MOUNT NF SERIES	LM3NF LM5NF LM9NF
32	1/1.8" 3CCD MEGAPIXEL NC3 SERIES	LM6NC3 LM12NC3 LM50NC3
33	MACRO ZOOM	LMZ50M LMZ45T3 LMZ68M LMZ69M
34	TELECENTRIC TC SERIES	LM1119TC LM1138TC LM1120TC LM1121TC LM1122TC LM1123TC LM1125TC LM50TC
38	VARIFOCAL	LMVZ166HC LMVZ1040 LMVZ4411 LMVZ655 LMVZ930-R

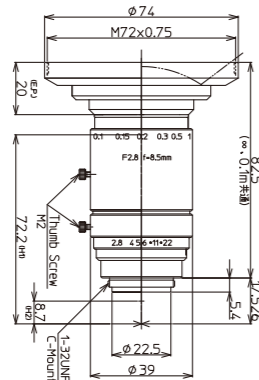
4/3" 8 MEGA 1" 6 MEGA 1" MEGA 1" RUG 10 MEGA 5 MEGA 3 MEGA WIDE MEGA 2/3" MEGA 2/3" RUG 2/3" JC 1/1.8" NCL SWIR NIR NF 3CCD MACRO TELECENTRIC VARIFOCAL

XC Series

High Resolution FA/MV Lenses

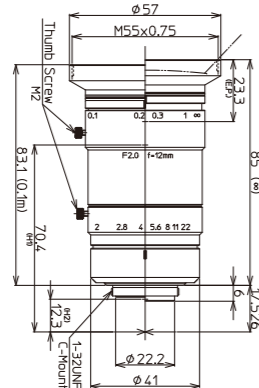
Features of XC Series

- ▶ Large image size of $\Phi 23\text{mm}$ incorporated within a C-mount design.
- ▶ Megapixel resolution is maintained throughout the entire image even when the iris is fully opened.
- ▶ High precision aspherical lens greatly reduces distortion and produces a high-definition picture.
- ▶ The LM8XC generates a very wide 93.5° horizontal angle of view.
- ▶ Kowa's floating mechanism system virtually eliminates optical aberrations from close distance to infinity.



Model	LM8XC
Focal Length(mm)	8.5
Image Size(mm)	18.4x13.8($\Phi 23$)
Iris Range(F-stop)	F2.8-F22
Focusing Range(m)	0.1- ∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	238.4(H)x179.1(V)
Angle of View	4/3 Inch: 93.5×77.1 1 Inch: 72.9×57.9 2/3 Inch: 53.8×41.6
Resolution(Center, Corner)	160lp/mm, 80lp/mm
TV Distortion(%)	0.12
Back Focus in Air(mm)	12.9
Mount	C-mount
Filter Thread(mm)	M72xP0.75
Size(mm)	$\Phi 74 \times 82.5$
Weight(g)	245
Temperature Range	$-10^\circ\text{C} \sim +50^\circ\text{C}$

4/3" 1" 2/3" 8.5mm FIXED 8MEGA C-mt METAL LO-DIS FLOAT XD
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion



Model	LM12XC
Focal Length(mm)	12
Image Size(mm)	18.4x13.8($\Phi 23$)
Iris Range(F-stop)	F2.0-F22
Focusing Range(m)	0.1- ∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	181.5(H)x135.5(V)
Angle of View	4/3 Inch: 74.9×59.6 1 Inch: 55.9×43.1 2/3 Inch: 39.8×30.2
Resolution(Center, Corner)	160lp/mm, 80lp/mm
TV Distortion(%)	0.59
Back Focus in Air(mm)	13.0
Mount	C-mount
Filter Thread(mm)	M55xP0.75
Size(mm)	$\Phi 57 \times 85$
Weight(g)	270
Temperature Range	$-10^\circ\text{C} \sim +50^\circ\text{C}$

4/3" 1" 2/3" 12mm FIXED 8MEGA C-mt METAL LO-DIS FLOAT XD
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion

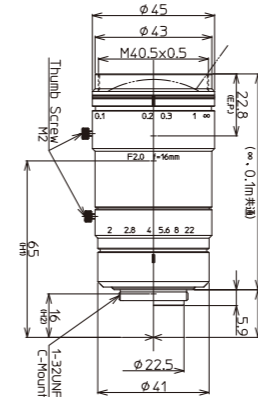
Magnification Using A Close Up Ring

You can use close up rings to increase the magnification and decrease the minimum object distance (M.O.D.) of the lens. Simply screw in the spacer ring between the threads of the lens mount and camera.



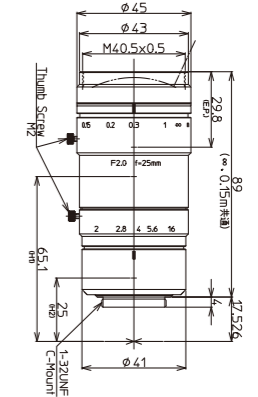
† Images may differ from the actual product.

LM16XC



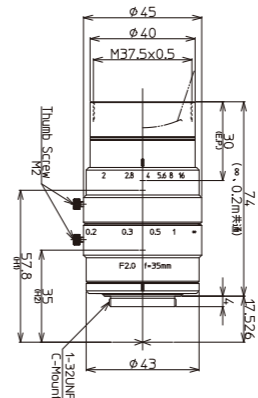
4/3" 1" 2/3" 16mm FIXED 8MEGA C-mt METAL LO-DIS FLOAT XD
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion

LM25XC



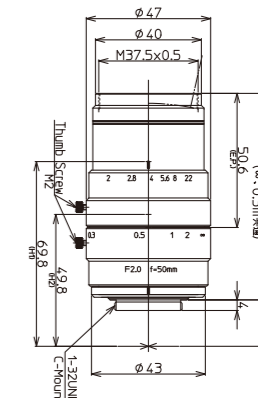
4/3" 1" 2/3" 25mm FIXED 8MEGA C-mt METAL LO-DIS FLOAT XD
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion

LM35XC



4/3" 1" 2/3" 35mm FIXED 8MEGA C-mt METAL LO-DIS FLOAT
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating

LM50XC



4/3" 1" 2/3" 50mm FIXED 8MEGA C-mt METAL LO-DIS FLOAT
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating

Model	LM16XC	LM25XC	LM35XC	LM50XC
Focal Length(mm)	16	25	35	50
Image Size(mm)	18.4x13.8($\Phi 23$)	18.4x13.8($\Phi 23$)	18.4x13.8($\Phi 23$)	18.4x13.8($\Phi 23$)
Iris Range(F-stop)	F2.0-F22	F2.0-F16	F2.0-F16	F2.0-F22
Focusing Range(m)	0.1- ∞	0.15- ∞	0.2- ∞	0.3- ∞
Control	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	134.6(H)x100.8(V)	124.8(H)x93.0(V)	100.3(H)x75.3(V)	100.2(H)x75.5(V)
Angle of View	4/3 Inch: 60.6×47.2 1 Inch: 44.0×33.6 2/3 Inch: 30.9×23.3	4/3 Inch: 40.9×31.1 1 Inch: 28.9×21.8 2/3 Inch: 20.1×15.2	4/3 Inch: 29.6×22.4 1 Inch: 20.8×15.6 2/3 Inch: 14.3×10.8	4/3 Inch: 20.6×15.7 1 Inch: 14.6×11.0 2/3 Inch: 10.1×7.6
Resolution(Center, Corner)	160lp/mm, 80lp/mm	160lp/mm, 80lp/mm	160lp/mm, 80lp/mm	160lp/mm, 80lp/mm
TV Distortion(%)	0.02	-0.57	-0.17	0.80
Back Focus in Air(mm)	13.0	24.3	15.2	21.6
Mount	C-mount	C-mount	C-mount	C-mount
Filter Thread(mm)	M40.5xP0.5	M40.5xP0.5	M37.5xP0.5	M37.5xP0.5
Size(mm)	$\Phi 45 \times 79.5$	$\Phi 45 \times 89$	$\Phi 45 \times 74$	$\Phi 47 \times 78$
Weight(g)	250	255	210	235
Temperature Range	$-10^\circ\text{C} \sim +50^\circ\text{C}$	$-10^\circ\text{C} \sim +50^\circ\text{C}$	$-10^\circ\text{C} \sim +50^\circ\text{C}$	$-10^\circ\text{C} \sim +50^\circ\text{C}$

Diagram of M.O.D. / Magnification Using A Close Up Ring

Model	LM8XC	LM12XC	LM16XC	LM25XC	LM35XC	LM50XC
(Non)M.O.D./Magnification	100mm/0.08x	100mm/0.10x	100mm/0.14x	150mm/0.15x	200mm/0.18x	300mm/0.18x
(1mm Ring)M.O.D./Magnification	30mm/0.19x	48mm/0.19x	64mm/0.20x	115mm/0.19x	174mm/0.21x	273mm/0.20x
(5mm Ring)M.O.D./Magnification	-	-	21mm/0.46x	56mm/0.35x	117mm/0.33x	204mm/0.28x
(10mm Ring)M.O.D./Magnification	-	-	-	31mm/0.55x	85mm/0.48x	158mm/0.39x
(20mm Ring)M.O.D./Magnification	-	-	-	12mm/0.96x	58mm/0.77x	115mm/0.59x

† Images may differ from the actual product.

SC Series

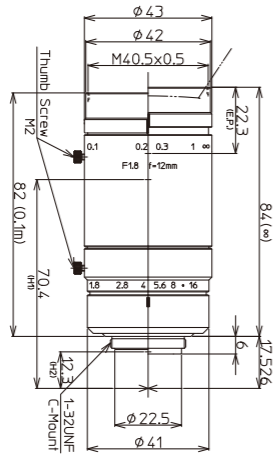
High Resolution FA/MV Lenses

Features of SC Series

- ▶ Large image size of $\Phi 16\text{mm}$ (C-mount).
- ▶ Able to maintain a sharp image with high resolution and contrast from the center to the corners of an image (less degradation of corner resolution).
- ▶ High precision aspherical lens greatly reduces distortion and creates a short minimum object distance.
- ▶ Kowa's wide-band multi-coating effectively decreases glare and refraction and produces a high transmission from the visible to NIR wavelength range.



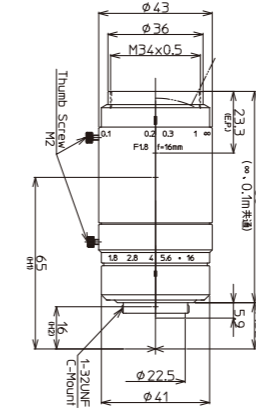
LM12SC



Model	LM12SC
Focal Length(mm)	12
Image Size(mm)	12.8×9.6($\Phi 16$)
Iris Range(F-stop)	F1.8-F16
Focusing Range(m)	0.1-∞
Control Iris	Manual
Focus	Manual
Shooting Range at M.O.D.(mm)	125.5(H)×93.5(V)
Angle of 1 Inch	55.9×43.1
View 2/3 Inch	39.8×30.2
(Degrees) 1/1.8 Inch	32.9×24.9
Resolution(Center, Corner)	160lp/mm, 120lp/mm
TV Distortion(%)	-0.55
Back Focus in Air(mm)	13.0
Mount	C-mount
Filter Thread(mm)	M40.5×P0.5
Size(mm)	$\Phi 43 \times 84.0$
Weight(g)	255
Temperature Range	-10°C~+50°C

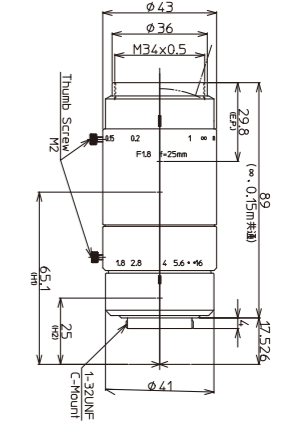
1" 2/3" 1/1.8" 12mm FIXED 6MEGA+ C-mt METAL LO-DIS FLOAT XD
 Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion

LM16SC



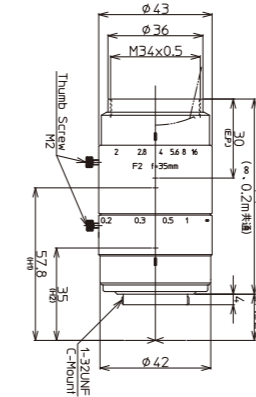
1" 2/3" 1/1.8" 16mm
 FIXED 6MEGA+ C-mt METAL LO-DIS FLOAT XD
 Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion

LM25SC



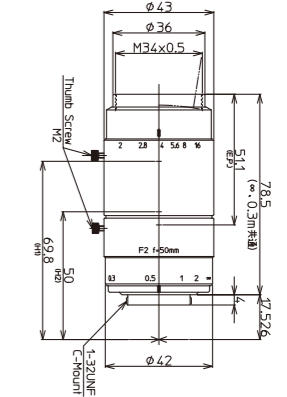
1" 2/3" 1/1.8" 25mm
 FIXED 6MEGA+ C-mt METAL LO-DIS FLOAT XD
 Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion

LM35SC



1" 2/3" 1/1.8" 35mm
 FIXED 6MEGA+ C-mt METAL LO-DIS FLOAT
 Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating

LM50SC



1" 2/3" 1/1.8" 50mm
 FIXED 6MEGA+ C-mt METAL LO-DIS FLOAT
 Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating

Model	LM16SC	LM25SC	LM35SC	LM50SC
Focal Length(mm)	16	25	35	50
Image Size(mm)	12.8×9.6($\Phi 16$)	12.8×9.6($\Phi 16$)	12.8×9.6($\Phi 16$)	12.8×9.6($\Phi 16$)
Iris Range(F-stop)	F1.8-F16	F1.8-F16	F2.0-F16	F2.0-F16
Focusing Range(m)	0.1-∞	0.2-∞	0.15-∞	0.3-∞
Control Iris	Manual	Manual	Manual	Manual
Focus	Manual	Manual	Manual	Manual
Shooting Range at M.O.D.(mm)	93.5(H)×69.9(V)	86.1(H)×64.4(V)	69.9(H)×52.4(V)	70.1(H)×52.7(V)
Angle of 1 Inch	44.0×33.6	28.9×21.8	20.8×15.6	14.6×11.0
View 2/3 Inch	30.9×23.3	20.1×15.2	14.3×10.8	10.1×7.6
(Degrees) 1/1.8 Inch	25.5×19.2	16.5×12.4	11.7×8.8	8.3×6.2
Resolution(Center, Corner)	160lp/mm, 120lp/mm	160lp/mm, 120lp/mm	160lp/mm, 120lp/mm	160lp/mm, 120lp/mm
TV Distortion(%)	0.02	-0.34	0.02	0.30
Back Focus in Air(mm)	13.0	24.3	15.2	21.6
Mount	C-mount	C-mount	C-mount	C-mount
Filter Thread(mm)	M34×P0.5	M34×P0.5	M34×P0.5	M34×P0.5
Size(mm)	$\Phi 43 \times 80.0$	$\Phi 43 \times 89.0$	$\Phi 43 \times 74.0$	$\Phi 43 \times 78.5$
Weight(g)	240	245	200	210
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

Diagram of M.O.D. / Magnification Using A Close Up Ring

Model	LM12SC	LM16SC	LM25SC	LM35SC	LM50SC
(Non)M.O.D./Magnification	100mm/0.10×	100mm/0.14×	150mm/0.15×	200mm/0.18×	300mm/0.18×
(1mm Ring)M.O.D./Magnification	48mm/0.19×	64mm/0.20×	115mm/0.19×	174mm/0.21×	273mm/0.20×
(5mm Ring)M.O.D./Magnification	-	21mm/0.46×	56mm/0.35×	117mm/0.33×	204mm/0.28×
(10mm Ring)M.O.D./Magnification	-	-	31mm/0.55×	85mm/0.48×	158mm/0.39×
(20mm Ring)M.O.D./Magnification	-	-	12mm/0.96×	58mm/0.77×	115mm/0.59×

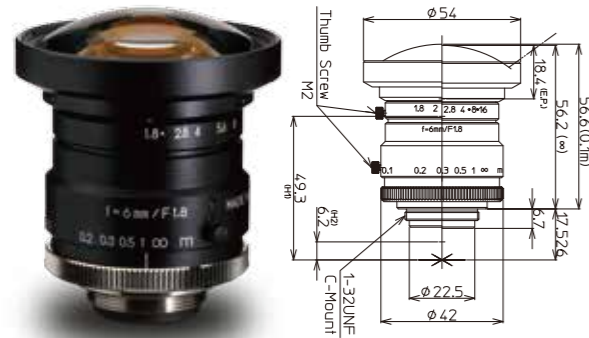
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HC Series

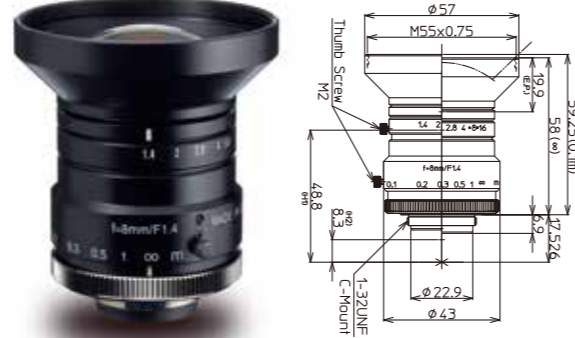
- ▶ Wide product range: 8 lenses in HC series
- ▶ Excellent corner brightness
- ▶ Low distortion
- ▶ For large format 1" megapixel applications
- ▶ High performance compact lenses

LM6HC



1" 2/3" 1/1.8" 6mm FIXED MEGA C-mt METAL
Fixed Focal Megapixel C-mount Metal Body

LM8HC



1" 2/3" 1/1.8" 8mm FIXED MEGA C-mt METAL
Fixed Focal Megapixel C-mount Metal Body

LM12HC



1" 2/3" 1/1.8" 12.5mm FIXED MEGA C-mt METAL
Fixed Focal Megapixel C-mount Metal Body

LM16HC



1" 2/3" 1/1.8" 16mm FIXED MEGA C-mt METAL
Fixed Focal Megapixel C-mount Metal Body

Model	LM6HC	LM8HC	LM12HC	LM16HC
Focal Length(mm)	6	8	12.5	16
Image Size(mm)	12.8×9.6(Φ16)	12.8×9.6(Φ16)	12.8×9.6(Φ16)	12.8×9.6(Φ16)
Iris Range(F-stop)	F1.8~F16	F1.4~F16	F1.4~F16	F1.4~F16
Focusing Range(m)	0.1~∞	0.1~∞	0.3~∞	0.3~∞
Control	Manual	Manual	Manual	Manual
Focus	Manual	Manual	Manual	Manual
Shooting Range at M.O.D.(mm)	267.4(H)×196.3(V)	196.0(H)×143.2(V)	330.6(H)×243.5(V)	251.5(H)×186.2(V)
Angle of 1 Inch	96.8×79.4	79.4×63.0	55.6×42.5	44.3×33.6
View 2/3 Inch	74.1×58.0	58.3×44.7	39.1×29.5	30.8×23.2
(Degrees) 1/1.8 Inch	62.6×48.2	48.5×36.9	32.1×24.2	25.3×19.0
Resolution(Center, Corner)	120lp/mm, 80lp/mm	120lp/mm, 80lp/mm	120lp/mm, 80lp/mm	120lp/mm, 80lp/mm
TV Distortion(%)	-0.2	-1.2	-1.58	-1.0
Back Focus in Air(mm)	11.1	11.2	12.6	12.6
Mount	C-mount	C-mount	C-mount	C-mount
Filter Thread(mm)	-	M55×P0.75	M35.5×P0.5	M35.5×P0.5
Size(mm)	Φ54×56.2	Φ57×58	Φ43×51.5	Φ43×52.9
Weight(g)	215	205	160	150
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

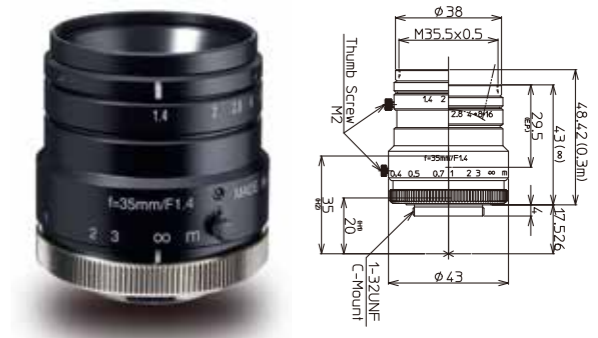
† Images may differ from the actual product.

LM25HC



1" 2/3" 1/1.8" 25mm FIXED MEGA C-mt METAL
Fixed Focal Megapixel C-mount Metal Body

LM35HC



1" 2/3" 1/1.8" 35mm FIXED MEGA C-mt METAL
Fixed Focal Megapixel C-mount Metal Body

LM50HC



1" 2/3" 1/1.8" 50mm FIXED MEGA C-mt METAL
Fixed Focal Megapixel C-mount Metal Body

LM75HC



1" 2/3" 1/1.8" 75mm FIXED MEGA C-mt METAL
Fixed Focal Megapixel C-mount Metal Body

Model	LM25HC	LM35HC	LM50HC	LM75HC
Focal Length(mm)	25	35	50	75
Image Size(mm)	12.8×9.6(Φ16)	12.8×9.6(Φ16)	12.8×9.6(Φ16)	12.8×9.6(Φ16)
Iris Range(F-stop)	F1.4~F16	F1.4~F16	F1.4~F16	F1.8~F16
Focusing Range(m)	0.3~∞	0.3~∞	0.5~∞	1.0~∞
Control	Manual	Manual	Manual	Manual
Focus	Manual	Manual	Manual	Manual
Shooting Range at M.O.D.(mm)	160.7(H)×119.2(V)	110.1(H)×82.0(V)	121.8(H)×91.3(V)	165.5(H)×123.9(V)
Angle of 1 Inch	29.3×22.0	20.9×15.8	14.5×10.8	9.7×7.3
View 2/3 Inch	20.2×15.1	14.4×10.8	10.0×7.5	6.7×5.0
(Degrees) 1/1.8 Inch	16.5×12.4	11.8×8.8	8.2×6.2	5.5×4.1
Resolution(Center, Corner)	120lp/mm, 80lp/mm	120lp/mm, 80lp/mm	120lp/mm, 80lp/mm	120lp/mm, 80lp/mm
TV Distortion(%)	-1.0	-0.5	0.05	-0.2
Back Focus in Air(mm)	16.5	16.8	14.8	14.5
Mount	C-mount	C-mount	C-mount	C-mount
Filter Thread(mm)	M35.5×P0.5	M35.5×P0.5	M40.5×P0.5	M46×P0.75
Size(mm)	Φ43×43	Φ43×43	Φ49×48	Φ49×57
Weight(g)	135	135	210	195
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

Diagram of M.O.D. / Magnification Using A Close Up Ring

Model	LM6HC	LM8HC	LM12HC	LM16HC	LM25HC	LM35HC	LM50HC	LM75HC
(Non)M.O.D./Magnification	100mm/0.05×	100mm/0.07×	300mm/0.04×	300mm/0.05×	300mm/0.08×	300mm/0.12×	500mm/0.11×	1000mm/0.078×
(1mm Ring)M.O.D./Magnification	-	-	93mm/0.12×	134mm/0.11×	200mm/0.12×	243mm/0.15×	424mm/0.13×	858mm/0.091×
(5mm Ring)M.O.D./Magnification	-	-	-	-	83mm/0.28×	138mm/0.26×	269mm/0.20×	553mm/0.14×
(10mm Ring)M.O.D./Magnification	-	-	-	-	-	91mm/0.40×	189mm/0.30×	389mm/0.21×
(20mm Ring)M.O.D./Magnification	-	-	-	-	-	-	124mm/0.50×	251mm/0.34×

† Images may differ from the actual product.

HC-V Series NEW

High Resolution FA/MV Lenses

Kowa's new HC-V series is made for use in high vibration and shock environments. With a design based on Kowa's standard 1" HC lenses, this new ruggedized megapixel lens series is ideal for applications that require increased durability and high optical performance.

Features of HC-V Series

- ▶ For megapixel applications requiring a sensor size of 1" (Φ16mm).
- ▶ Unique mechanical design to guard against strong vibration and shock.
- ▶ Two way reversible nut is utilized to tightly lock the focus adjustment ring in place.
- ▶ All internal glass elements are glued to the inside housing to improve stability.
- ▶ Interchangeable iris plates are used to select the F-stop.

Interchangeable Iris Plates

- The HC-V series uses interchangeable iris plates instead of mechanical iris diaphragms with moving blades. You can choose from four iris plates to adjust the F-stop.



Variable Step Up Rings

Focus Adjustment Procedure

- Unscrew the bottom ring of the outside body to adjust the focus to optimal position.
- Screw the red two way reversible nut on the center body towards the bottom ring to lock in the focus.



Two Way Reversible Nut

LM8HC-V LM12HC-V LM16HC-V LM25HC-V LM35HC-V LM50HC-V

NEW LM8HC-V



1" 2/3" 1/1.8" 8mm **FIXED** **MEGA** **C-mt** **METAL** **RUGGED**
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

NEW LM12HC-V



1" 2/3" 1/1.8" 12.5mm **FIXED** **MEGA** **C-mt** **METAL** **RUGGED**
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

NEW LM16HC-V



1" 2/3" 1/1.8" 16mm **FIXED** **MEGA** **C-mt** **METAL** **RUGGED**
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

NEW LM25HC-V



1" 2/3" 1/1.8" 25mm **FIXED** **MEGA** **C-mt** **METAL** **RUGGED**
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

NEW LM35HC-V



1" 2/3" 1/1.8" 35mm **FIXED** **MEGA** **C-mt** **METAL** **RUGGED**
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

NEW LM50HC-V



1" 2/3" 1/1.8" 50mm **FIXED** **MEGA** **C-mt** **METAL** **RUGGED**
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

Model	LM8HC-V	LM12HC-V	LM16HC-V	LM25HC-V	LM35HC-V	LM50HC-V
Focal Length (mm)	8	12.5	16	25	35	50
Image Size (mm)	12.8×9.6 (Φ16)	12.8×9.6 (Φ16)	12.8×9.6 (Φ16)	12.8×9.6 (Φ16)	12.8×9.6 (Φ16)	12.8×9.6 (Φ16)
Iris Range (F-stop)	F1.4/F2.8/F4/F8	F1.4/F2.8/F4/F8	F1.4/F2.8/F4/F8	F1.4/F2.8/F4/F8	F1.4/F2.8/F4/F8	F1.4/F2.8/F4/F8
Focusing Range (m)	0.1~∞	0.3~∞	0.3~∞	0.3~∞	0.3~∞	0.5~∞
Control Iris	-	-	-	-	-	-
Focus	Manual	Manual	Manual	Manual	Manual	Manual
Shooting Range at M.O.D. (mm)	196.0(H)×143.0(V)	330.6(H)×243.5(V)	251.5(H)×186.2(V)	160.7(H)×119.2(V)	110.1(H)×82.0(V)	121.8(H)×91.3(V)
Angle of View (Degrees)	1 Inch: 79.7×63.0 2/3 Inch: 58.3×44.7 1/1.8 Inch: 48.5×36.9	1 Inch: 55.6×42.5 2/3 Inch: 39.1×29.5 1/1.8 Inch: 32.1×24.2	1 Inch: 44.3×33.6 2/3 Inch: 30.8×23.2 1/1.8 Inch: 25.3×19.0	1 Inch: 29.3×22.0 2/3 Inch: 20.2×15.1 1/1.8 Inch: 16.5×12.4	1 Inch: 20.9×15.8 2/3 Inch: 14.4×10.8 1/1.8 Inch: 11.8×8.8	1 Inch: 14.5×10.8 2/3 Inch: 10.0×7.5 1/1.8 Inch: 8.2×6.2
TV Distortion (%)	-1.2	-1.58	-1.0	-1.0	-0.5	0.05
Back Focus in Air (mm)	11.2	12.6	12.6	16.5	16.8	14.8
Mount	C-mount	C-mount	C-mount	C-mount	C-mount	C-mount
Filter Thread (mm)	M55×P0.75	M35.5×P0.5	M35.5×P0.5	M35.5×P0.5	M35.5×P0.5	M40.5×P0.5
Size (mm)	Φ58×58	Φ44×51.5	Φ44×53	Φ44×43	Φ46×44.1	Φ50×48
Weight(g)	183	130	120	104	133	170
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

† Images may differ from the actual product.

† Images may differ from the actual product.

JC10M Series

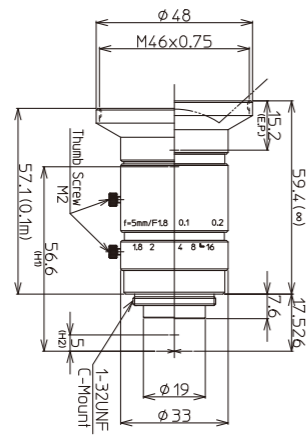
High Resolution FA/MV Lenses

Features of JC10M Series

- ▶ 200lp/mm center resolution and low distortion maximize performance of high-end inspection.
- ▶ Incorporating Kowa's wide-band coating and floating mechanism system, the JC10M lens series greatly reduces chromatic aberration from close distance to infinity and maintains a high transmission from visible to NIR.
- ▶ Short minimum object distance and compact design using aspherical lenses (5 models/f=5~25mm) allow for easy installation in compact machine vision systems.



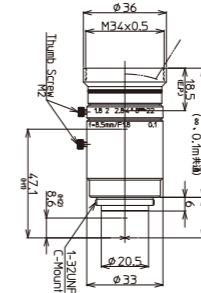
LM5JC10M



Model	LM5JC10M
Focal Length(mm)	5
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.8-F16
Focusing Range(m)	0.1~∞
Control Iris	Manual
Focus	Manual
Shooting Range at M.O.D.(mm)	197.0(H)×147.0(V)
Angle of View	2/3 Inch 82.2×66.5 1/1.8 Inch 71.1×56.5 1/2 Inch 64.9×51.1
Resolution(Center, Corner)	200lp/mm, 160lp/mm
TV Distortion(%)	-0.33
Back Focus in Air(mm)	10.3
Mount	C-mount
Filter Thread(mm)	M46×P0.75
Size(mm)	Φ48×59.4
Weight(g)	120
Temperature Range	-10°C~+50°C

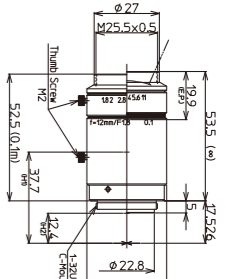
2/3" 1/1.8" 1/2" 5mm FIXED 10MEGA C-mt METAL LO-DIS FLOAT XD
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion

LM8JC10M



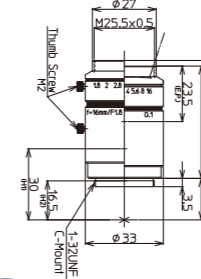
2/3" 1/1.8" 1/2" 8.5mm
FIXED 10MEGA C-mt METAL LO-DIS FLOAT XD
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion

LM12JC10M



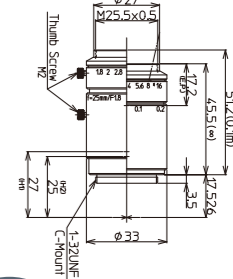
2/3" 1/1.8" 1/2" 12mm
FIXED 10MEGA C-mt METAL LO-DIS FLOAT XD
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion

LM16JC10M



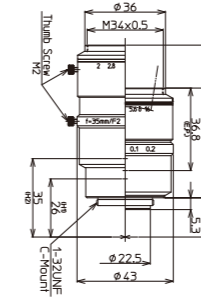
2/3" 1/1.8" 1/2" 16mm
FIXED 10MEGA C-mt METAL LO-DIS FLOAT
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating

LM25JC10M



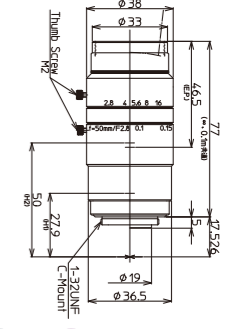
2/3" 1/1.8" 1/2" 25mm
FIXED 10MEGA C-mt METAL LO-DIS FLOAT
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating

LM35JC10M



2/3" 1/1.8" 1/2" 35mm
FIXED 10MEGA C-mt METAL LO-DIS FLOAT
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating

LM50JC10M



2/3" 1/1.8" 1/2" 50mm
FIXED 10MEGA C-mt METAL LO-DIS FLOAT XD
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating Extra Low Dispersion

Model	LM8JC10M	LM12JC10M	LM16JC10M	LM25JC10M	LM35JC10M	LM50JC10M
Focal Length(mm)	8.5	12	16	25	35	50
Image Size(mm)	8.8×6.6(Φ11)	8.8×6.6(Φ11)	8.8×6.6(Φ11)	8.8×6.6(Φ11)	8.8×6.6(Φ11)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.8-F22	F1.8-F11	F1.8-F16	F1.8-F16	F2.0-F16	F2.8-F16
Focusing Range(m)	0.1~∞	0.1~∞	0.1~∞	0.1~∞	0.1~∞	0.1~∞
Control Iris	Manual	Manual	Manual	Manual	Manual	Manual
Focus	Manual	Manual	Manual	Manual	Manual	Manual
Shooting Range at M.O.D.(mm)	133.2(H)×99.6(V)	80.7(H)×60.2(V)	61.1(H)×45.7(V)	36.7(H)×27.5(V)	23.4(H)×17.6(V)	19.1(H)×14.3(V)
Angle of View	2/3 Inch 54.0×41.9 1/1.8 Inch 45.3×34.8 (Degrees) 1/2 Inch 40.8×31.2	39.1×29.8 32.4×24.6 28.9×21.9	30.0×22.7 24.7×18.6 22.0×16.6	20.0×15.1 16.4×12.3 14.6×11.0	14.3×10.8 11.7×8.8 10.4×7.8	10.1×7.6 8.2×6.1 7.3×5.5
Resolution(Center, Corner)	200lp/mm, 160lp/mm	200lp/mm, 160lp/mm	200lp/mm, 160lp/mm	200lp/mm, 160lp/mm	200lp/mm, 160lp/mm	200lp/mm, 160lp/mm
TV Distortion(%)	0.31	-0.12	-0.20	-0.09	0.05	-0.02
Back Focus in Air(mm)	12.1	13.9	14.6	17.9	14.2	12.8
Mount	C-mount	C-mount	C-mount	C-mount	C-mount	C-mount
Filter Thread(mm)	M34×P0.5	M25.5×P0.5	M25.5×P0.5	M25.5×P0.5	M34×P0.5	M30.5×P0.5
Size(mm)	Φ36×56.0	Φ33×53.5	Φ33×47.5	Φ33×45.5	Φ43×49	Φ38×77
Weight(g)	115	105	90	95	160	170
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

Diagram of M.O.D. / Magnification Using A Close Up Ring

Model	LM5JC10M	LM8JC10M	LM12JC10M	LM16JC10M	LM25JC10M	LM35JC10M	LM50JC10M
(Non)M.O.D./Magnification	100mm/0.05×	100mm/0.07×	100mm/0.11×	100mm/0.15×	100mm/0.24×	100mm/0.38×	100mm/0.46×
(1mm Ring)M.O.D./Magnification	-	20mm/0.20×	48mm/0.19×	61mm/0.21×	79mm/0.28×	85mm/0.40×	91mm/0.48×
(5mm Ring)M.O.D./Magnification	-	-	-	18mm/0.45×	46mm/0.44×	65mm/0.50×	76mm/0.58×
(10mm Ring)M.O.D./Magnification	-	-	-	-	29mm/0.63×	49mm/0.62×	64mm/0.70×
(20mm Ring)M.O.D./Magnification	-	-	-	-	-	31mm/0.87×	49mm/0.94×

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† Images may differ from the actual product.

JC5M2 Series

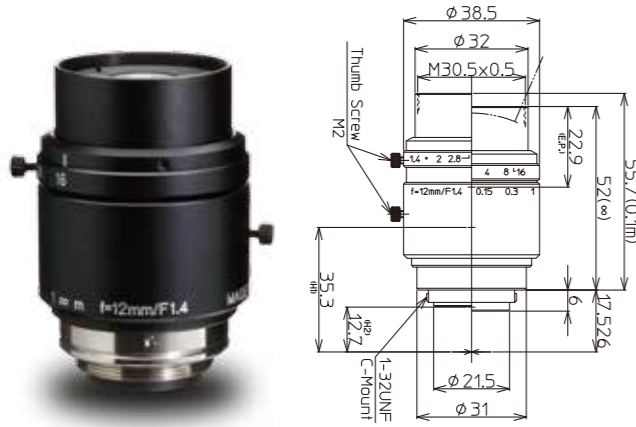
Kowa's JC5M2 lens series is perfect for high-end applications that require the use of 5 megapixel camera.

Features of JC5M2 Series

- ▶ Incorporating Kowa's floating mechanism system, the JC5M2 lens series greatly reduces chromatic aberration from close distance to infinity.
- ▶ With a fast F-stop, locking screws, and a compact design, these lenses provide a good value between price versus performance.



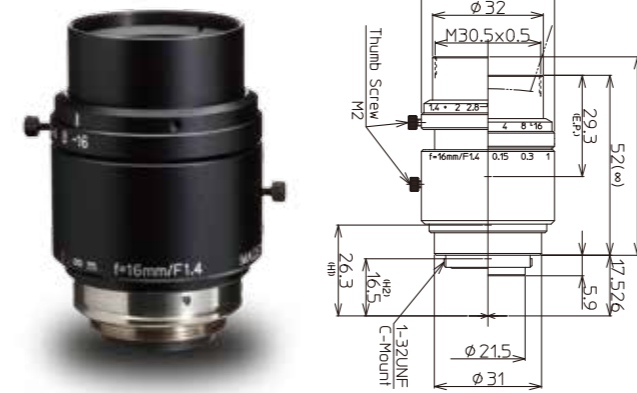
LM12JC5M2



Model	LM12JC5M2
Focal Length(mm)	12.5
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.4~F16
Focusing Range(m)	0.1~∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	81.4(H)×60.9(V)
Angle of View	2/3 Inch: 38.4×29.2 1/1.8 Inch: 31.7×24.0 1/2 Inch: 28.4×21.4
Resolution(Center, Corner)	160lp/mm, 125lp/mm
TV Distortion(%)	-0.06
Back Focus in Air(mm)	11.5
Mount	C-mount
Filter Thread(mm)	M30.5×P0.5
Size(mm)	Φ38.5×52
Weight(g)	130
Temperature Range	-10°C~+50°C



LM16JC5M2



LM25JC5M2



LM35JC5M2



Diagram of M.O.D. / Magnification Using A Close Up Ring

Model	LM12JC5M2	LM16JC5M2	LM25JC5M2	LM35JC5M2
(Non)M.O.D./Magnification	100mm/0.109×	100mm/0.137×	100mm/0.251×	180mm/0.209×
(1mm Ring)M.O.D./Magnification	50mm/0.184×	62mm/0.195×	86mm/0.288×	160mm/0.235×
(5mm Ring)M.O.D./Magnification	-	-	54mm/0.434×	109mm/0.341×
(10mm Ring)M.O.D./Magnification	-	-	-	78mm/0.470×
(20mm Ring)M.O.D./Magnification	-	-	-	49mm/0.728×

Model	LM16JC5M2
Focal Length(mm)	16
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.4~F16
Focusing Range(m)	0.1~∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	64.6(H)×48.4(V)
Angle of View	2/3 Inch: 29.9×22.7 1/1.8 Inch: 24.7×18.6 1/2 Inch: 22.0×16.6
Resolution(Center, Corner)	160lp/mm, 125lp/mm
TV Distortion(%)	0.03
Back Focus in Air(mm)	11.6
Mount	C-mount
Filter Thread(mm)	M30.5×P0.5
Size(mm)	Φ38.5×52
Weight(g)	125
Temperature Range	-10°C~+50°C

Model	LM25JC5M2
Focal Length(mm)	25
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.6~F16
Focusing Range(m)	0.1~∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	35.1(H)×26.3(V)
Angle of View	2/3 Inch: 19.9×15.0 1/1.8 Inch: 16.4×12.3 1/2 Inch: 14.6×10.9
Resolution(Center, Corner)	160lp/mm, 125lp/mm
TV Distortion(%)	-0.01
Back Focus in Air(mm)	11.2
Mount	C-mount
Filter Thread(mm)	M30.5×P0.5
Size(mm)	Φ38.5×45.5
Weight(g)	115
Temperature Range	-10°C~+50°C

Model	LM35JC5M2
Focal Length(mm)	35
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.6~F16
Focusing Range(m)	0.18~∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	42.1(H)×31.6(V)
Angle of View	2/3 Inch: 14.3×10.8 1/1.8 Inch: 11.7×8.8 1/2 Inch: 10.4×7.8
Resolution(Center, Corner)	160lp/mm, 125lp/mm
TV Distortion(%)	-0.03
Back Focus in Air(mm)	12.2
Mount	C-mount
Filter Thread(mm)	M30.5×P0.5
Size(mm)	Φ38.5×48
Weight(g)	120
Temperature Range	-10°C~+50°C

† Images may differ from the actual product.

† Images may differ from the actual product.

JC3M2 Series NEW

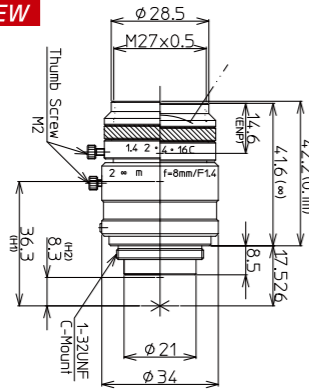
High Resolution FA/MV Lenses

Features of XC Series

- ▶ Kowa's wide-band multi-coating effectively decreases glare and refraction and produces a high transmission from the visible to NIR wavelength range.
- ▶ Kowa's floating mechanism system virtually eliminates optical aberrations from close distance to infinity.
- ▶ Low distortion *Except for LM8JC3M2 and LM12JC3M2
- ▶ Excellent corner brightness
- ▶ Applicable on 1/1.2" as well *Except for LM8JC3M2



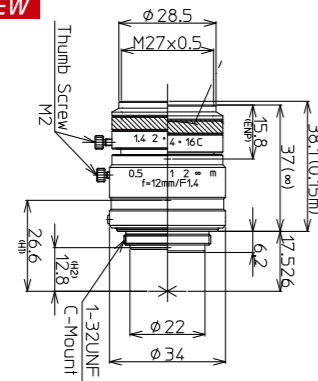
LM8JC3M2 NEW



Model	LM8JC3M2
Focal Length(mm)	8
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.4~Close
Focusing Range(m)	0.1~∞
Control Iris	Manual
Focus	Manual
Shooting Range at M.O.D.(mm)	120.3(H)×90.0(V)
Angle of 2/3 Inch	56.5×43.9
View 1/1.8 Inch	47.4×36.3
(Degrees) 1/2 Inch	42.6×32.5
TV Distortion(%)	-0.6
Back Focus in Air(mm)	9.5
Mount	C-mount
Filter Thread(mm)	M27×P0.5
Size(mm)	Φ34×41.6
Weight(g)	90
Temperature Range	-10°C~+50°C

2/3" 1/1.8" 1/2" 8mm **FIXED** **3MEGA** **C-mt** **METAL**
Fixed Focal Megapixel C-mount Metal Body

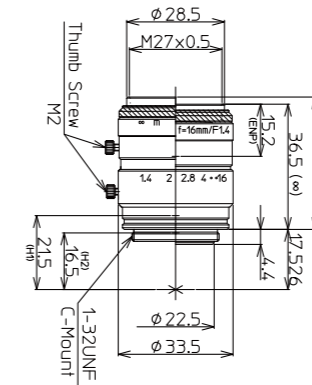
LM12JC3M2 NEW



Model	LM12JC3M2
Focal Length(mm)	12
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.4~Close
Focusing Range(m)	0.15~∞
Control Iris	Manual
Focus	Manual
Shooting Range at M.O.D.(mm)	110.0(H)×82.5(V)
Angle of 2/3 Inch	38.3×29.1
View 1/1.8 Inch	31.7×24.0
(Degrees) 1/2 Inch	28.3×21.4
TV Distortion(%)	-0.07
Back Focus in Air(mm)	11.7
Mount	C-mount
Filter Thread(mm)	M27×P0.5
Size(mm)	Φ34×37
Weight(g)	85
Temperature Range	-10°C~+50°C

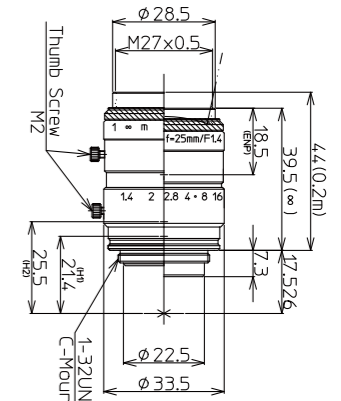
2/3" 1/1.8" 1/2" 12mm **FIXED** **3MEGA** **C-mt** **METAL**
Fixed Focal Megapixel C-mount Metal Body

LM16JC3M2 NEW



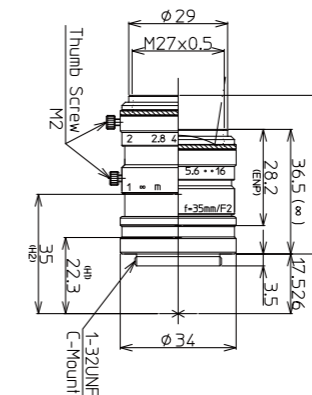
2/3" 1/1.8" 1/2" 16mm **FIXED** **3MEGA** **C-mt** **METAL** **FLOAT**
Fixed Focal Megapixel C-mount Metal Body Floating

LM25JC3M2 NEW



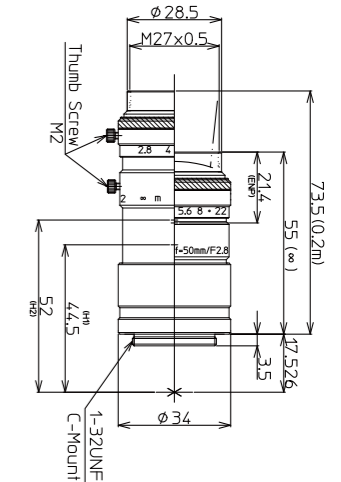
2/3" 1/1.8" 1/2" 25mm **FIXED** **3MEGA** **C-mt** **METAL** **FLOAT**
Fixed Focal Megapixel C-mount Metal Body Floating

LM35JC3M2 NEW



2/3" 1/1.8" 1/2" 35mm **FIXED** **3MEGA** **C-mt** **METAL** **FLOAT**
Fixed Focal Megapixel C-mount Metal Body Floating

LM50JC3M2 NEW



2/3" 1/1.8" 1/2" 50mm **FIXED** **3MEGA** **C-mt** **METAL** **FLOAT**
Fixed Focal Megapixel C-mount Metal Body Floating

Model	LM16JC3M2	LM25JC3M2	LM35JC3M2	LM50JC3M2
Focal Length(mm)	16	25	35	50
Image Size(mm)	8.8×6.6(Φ11)	8.8×6.6(Φ11)	8.8×6.6(Φ11)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.4~F16	F1.4~F16	F2.0~F16	F2.8~F22
Focusing Range(m)	0.2~∞	0.2~∞	0.2~∞	0.2~∞
Control Iris	Manual	Manual	Manual	Manual
Focus	Manual	Manual	Manual	Manual
Shooting Range at M.O.D.(mm)	112.8(H)×84.4(V)	71.1(H)×53.3(V)	47.9(H)×35.8(V)	29.3(H)×21.9(V)
Angle of 2/3 Inch	30.0×22.7	19.6×14.8	14.4×10.8	9.6×7.2
View 1/1.8 Inch	24.7×18.6	16.1×12.1	11.8×8.8	7.9×5.9
(Degrees) 1/2 Inch	21.8×16.4	14.0×10.5	10.5×7.9	7.0×5.2
TV Distortion(%)	-0.05	-0.04	-0.2	-0.03
Back Focus in Air(mm)	13.1	11.7	20.1	35.5
Mount	C-mount	C-mount	C-mount	C-mount
Filter Thread(mm)	M27×P0.5	M27×P0.5	M27×P0.5	M27×P0.5
Size(mm)	Φ33.5×36.5	Φ33.5×39.5	Φ34×36.5	Φ34×55
Weight(g)	85	90	90	95
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

† Images may differ from the actual product.

† Images may differ from the actual product.

NCM/JCM Series

High Resolution FA/MV Lenses

Features of WIDE NCM/JCM Series

- ▶ Super wide optical design
 - ▶ Large angle of view
 - ▶ Expansion angle
(Horizontal angle 82degree, Vertical angle 66degree)
- † 2/3" model: LM5JCM, 1/1.8" model: LM3NCM

Low distortion

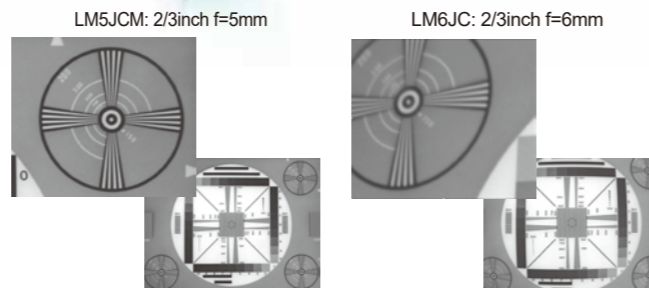
- ▶ Reduces the distortion to corner
- † LM5JCM: Under 0.5%, LM3NCM: Under 0.4% (TV distortion)

High quality

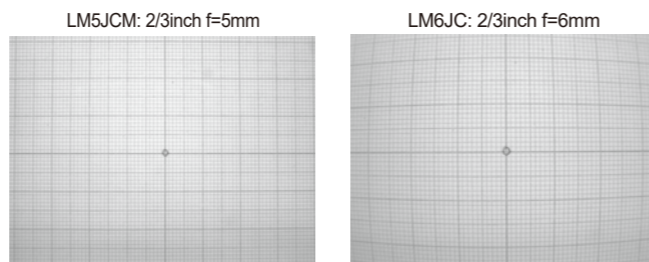
- ▶ Adapts to 2 megapixel cameras
- ▶ Improves center and corner resolution
- ▶ High transmittance



Corner image comparison
(Super wide angle lens vs. Standard lens)

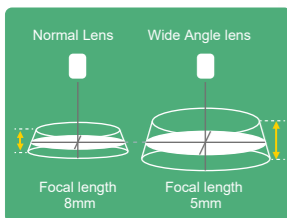


Distortion comparison at short distance object

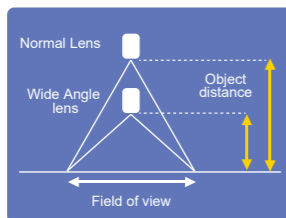


Capture image taken by 2megapixel camera

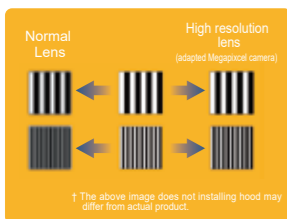
Long Depth of field



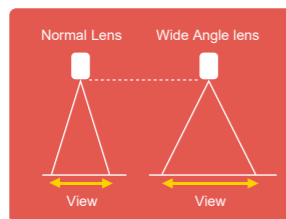
Short Close distance



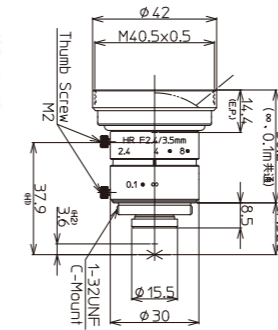
Clear image



Large field of view

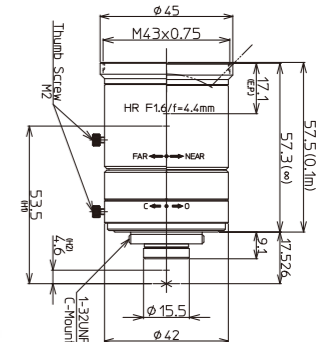


LM3NCM



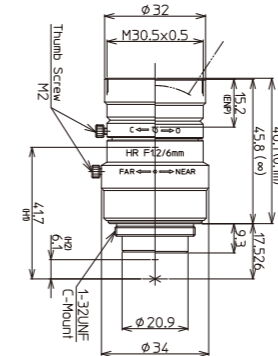
1/1.8" 1/2" 1/3" 3.5mm FIXED MEGA C-mnt METAL LO-DIS
Fixed Focal Megapixel C-mount Metal Body Low Distortion

LM4NCM



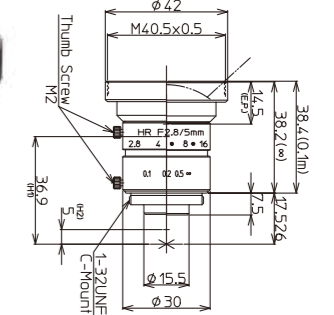
1/1.8" 1/2" 1/3" 4.4mm FIXED MEGA C-mnt METAL LO-DIS
Fixed Focal Megapixel C-mount Metal Body Low Distortion

LM6NCM



1/2" 1/3" 6mm FIXED MEGA C-mnt METAL LO-DIS
Fixed Focal Megapixel C-mount Metal Body Low Distortion

LM5JCM



2/3" 1/1.8" 1/2" 5mm FIXED MEGA C-mnt METAL LO-DIS
Fixed Focal Megapixel C-mount Metal Body Low Distortion

Model	LM3NCM	LM4NCM	LM6NCM	LM5JCM
Focal Length(mm)	3.5	4.4	6	5
Image Size(mm)	7.2×5.4(Φ9)	7.2×5.4(Φ9)	6.4×4.8(Φ8)	8.8×6.6(Φ11)
Iris Range(F-stop)	F2.4~F14	F1.6~F16	F1.2~Close	F2.8~F16
Focusing Range(m)	0.1~∞	0.1~∞	0.1~∞	0.1~∞
Control	Manual	Manual	Manual	Manual
Focus	Manual	Manual	Manual	Manual
Shooting Range at M.O.D.(mm)	226.3(H)×171.4(V)	190.0(H)×141.2(V)	122.2(H)×91.0(V)	200.8(H)×150.8(V)
Angle of View	2/3 inch -	-	-	82.4×66.9
(Degrees)	1/1.8 inch 89.0×73.8	76.6×61.3	-	71.7×57.1
	1/2 inch 82.4×66.9	70.2×55.5	56.2×43.5	65.2×51.3
	1/3 inch 66.9×52.7	55.5×43	43.5×33.2	-
Resolution(Center, Corner)	120lp/mm, 100lp/mm	120lp/mm, 100lp/mm	120lp/mm, 100lp/mm	120lp/mm, 100lp/mm
TV Distortion(%)	0.4	-0.2	-0.2	0.5
Back Focus in Air(mm)	9.7	8.8	8.2	10.0
Mount	C-mount	C-mount	C-mount	C-mount
Filter Thread(mm)	M40.5×P0.5	M43×P0.75	M30.5×P0.5	M40.5×P0.5
Size(mm)	Φ42×38.2	Φ45×57.3	Φ34×45.8	Φ42×38.2
Weight(g)	85	150	100	84
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

† Images may differ from the actual product.

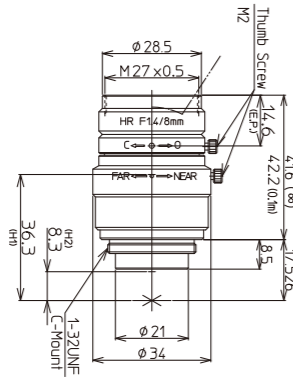
† Images may differ from the actual product.

JCM Series

- ▶ World standard and popular lens series
- ▶ Excellent corner brightness
- ▶ Low distortion
- ▶ For megapixel applications
- ▶ High resolution

Option : Models with iris & focus scales (LM-JC1MS Series)

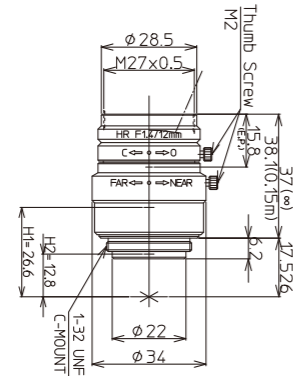
LM8JCM



2/3" 1/1.8" 1/2" 8mm **FIXED** **MEGA** **C-mt** **METAL** **LO-DIS**
Fixed Focal Megapixel C-mount Metal Body Low Distortion

Model	LM8JCM
Focal Length(mm)	8
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.4~Close
Focusing Range(m)	0.1~∞
Control	Iris Manual Focus Manual
Shooting Range at M.O.D.(mm)	120.3(H)×90.0(V)
Angle of View	2/3 Inch 56.5×43.9 1/1.8 Inch 47.4×36.3 1/2 Inch 42.6×32.5
Resolution(Center, Corner)	120lp/mm, 100lp/mm
TV Distortion(%)	-0.6
Back Focus in Air(mm)	9.7
Mount	C-mount
Filter Thread(mm)	M27×P0.5
Size(mm)	Φ34×41.6
Weight(g)	90
Temperature Range	-10°C~+50°C

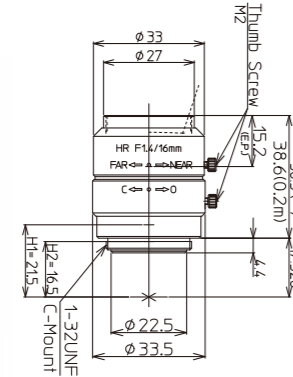
LM12JCM



2/3" 1/1.8" 1/2" 12mm **FIXED** **MEGA** **C-mt** **METAL** **LO-DIS**
Fixed Focal Megapixel C-mount Metal Body Low Distortion

Model	LM12JCM
Focal Length(mm)	12
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.4~Close
Focusing Range(m)	0.15~∞
Control	Iris Manual Focus Manual
Shooting Range at M.O.D.(mm)	110.0(H)×82.5(V)
Angle of View	2/3 Inch 38.3×29.1 1/1.8 Inch 31.7×24.0 1/2 Inch 28.3×21.4
Resolution(Center, Corner)	120lp/mm, 100lp/mm
TV Distortion(%)	-0.07
Back Focus in Air(mm)	11.7
Mount	C-mount
Filter Thread(mm)	M27×P0.5
Size(mm)	Φ34×37
Weight(g)	85
Temperature Range	-10°C~+50°C

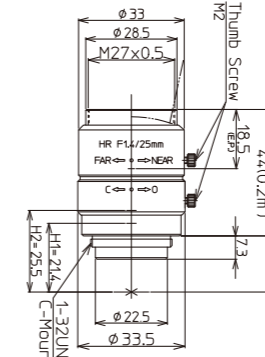
LM16JCM



2/3" 1/1.8" 1/2" 16mm **FIXED** **MEGA** **C-mt** **METAL** **LO-DIS** **FLOAT**
Fixed Focal Megapixel C-mount Metal Body Low Distortion Floating

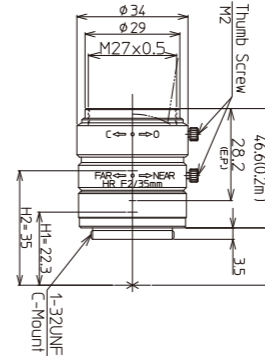
Model	LM16JCM
Focal Length(mm)	16
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.4~F16
Focusing Range(m)	0.2~∞
Control	Iris Manual Focus Manual
Shooting Range at M.O.D.(mm)	112.8(H)×84.4(V)
Angle of View	2/3 Inch 30.0×22.7 1/1.8 Inch 24.7×18.6 1/2 Inch 21.8×16.4
Resolution(Center, Corner)	120lp/mm, 100lp/mm
TV Distortion(%)	-0.05
Back Focus in Air(mm)	13.1
Mount	C-mount
Filter Thread(mm)	M25.5×P0.5
Size(mm)	Φ33.5×36.5
Weight(g)	85
Temperature Range	-10°C~+50°C

LM25JCM



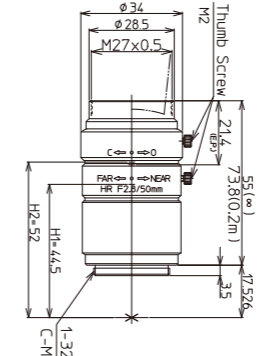
2/3" 1/1.8" 1/2" 25mm **FIXED** **MEGA** **C-mt** **METAL** **FLOAT**
Fixed Focal Megapixel C-mount Metal Body Floating

LM35JCM



2/3" 1/1.8" 1/2" 35mm **FIXED** **MEGA** **C-mt** **METAL** **FLOAT**
Fixed Focal Megapixel C-mount Metal Body Floating

LM50JCM



2/3" 1/1.8" 1/2" 50mm **FIXED** **MEGA** **C-mt** **METAL** **FLOAT**
Fixed Focal Megapixel C-mount Metal Body Floating

Diagram of M.O.D. / Magnification Using A Close Up Ring

Model	LM8JCM	LM12JCM	LM16JCM	LM25JCM	LM35JCM	LM50JCM
(Non)M.O.D./Magnification	100mm/0.07×	150mm/0.08×	200mm/0.08×	200mm/0.12×	200mm/0.18×	200mm/0.30×
(1mm Ring)M.O.D./Magnification	30mm/0.20×	70mm/0.16×	110mm/0.14×	150mm/0.16×	175mm/0.21×	190mm/0.32×
(5mm Ring)M.O.D./Magnification	-	-	-	73mm/0.31×	115mm/0.32×	160mm/0.39×
(10mm Ring)M.O.D./Magnification	-	-	-	-	81mm/0.46×	135mm/0.48×
(20mm Ring)M.O.D./Magnification	-	-	-	-	51mm/0.73×	105mm/0.65×

Model	LM25JCM
Focal Length(mm)	25
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.4~F16
Focusing Range(m)	0.2~∞
Control	Iris Manual Focus Manual
Shooting Range at M.O.D.(mm)	71.1(H)×53.3(V)
Angle of View	2/3 Inch 19.6×14.8 1/1.8 Inch 16.1×12.1 1/2 Inch 14.0×10.5
Resolution(Center, Corner)	120lp/mm, 100lp/mm
TV Distortion(%)	-0.04
Back Focus in Air(mm)	11.7
Mount	C-mount
Filter Thread(mm)	M27×P0.5
Size(mm)	Φ33.5×39.5
Weight(g)	90
Temperature Range	-10°C~+50°C

Model	LM35JCM
Focal Length(mm)	35
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F2.0~F16
Focusing Range(m)	0.2~∞
Control	Iris Manual Focus Manual
Shooting Range at M.O.D.(mm)	47.9(H)×35.8(V)
Angle of View	2/3 Inch 14.4×10.8 1/1.8 Inch 11.8×8.8 1/2 Inch 10.5×7.9
Resolution(Center, Corner)	120lp/mm, 100lp/mm
TV Distortion(%)	-0.2
Back Focus in Air(mm)	20.1
Mount	C-mount
Filter Thread(mm)	M27×P0.5
Size(mm)	Φ34×36.5
Weight(g)	70
Temperature Range	-10°C~+50°C

Model	LM50JCM
Focal Length(mm)	50
Image Size(mm)	8.8×6.6(Φ11)
Iris Range(F-stop)	F2.8~F22
Focusing Range(m)	0.2~∞
Control	Iris Manual Focus Manual
Shooting Range at M.O.D.(mm)	29.3(H)×21.9(V)
Angle of View	2/3 Inch 9.6×7.2 1/1.8 Inch 7.9×5.9 1/2 Inch 7.0×5.2
Resolution(Center, Corner)	120lp/mm, 100lp/mm
TV Distortion(%)	-0.03
Back Focus in Air(mm)	35.5
Mount	C-mount
Filter Thread(mm)	M27×P0.5
Size(mm)	Φ34×55
Weight(g)	95
Temperature Range	-10°C~+50°C

† Images may differ from the actual product.

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JCM-V Series

High Resolution FA/MV Lenses

Kowa's new JCM-V series is made for use in high vibration and shock environments. With a design based on Kowa's standard 2/3" JCM lenses, this new ruggedized megapixel lens series is ideal for applications that require increased durability and high optical performance.

Features of JCM-V Series

- ▶ For megapixel applications requiring a sensor size of 2/3" (Φ11mm) or smaller.
- ▶ Unique mechanical design to guard against strong vibration and shock.
- ▶ Two way reversible nut is utilized to tightly lock the focus adjustment ring in place.
- ▶ All internal glass elements are glued to the inside housing to improve stability.
- ▶ Interchangeable iris plates are used to select the F-stop.

Interchangeable Iris Plates

- The JCM-V series uses interchangeable iris plates instead of mechanical iris diaphragms with moving blades. You can choose from four iris plates to adjust the F-stop.



Variable Step Up Rings

Focus Adjustment Procedure

- Unscrew the bottom ring of the outside body to adjust the focus to optimal position.
- Screw the red two way reversible nut on the center body towards the bottom ring to lock in the focus.



Two Way Reversible Nut



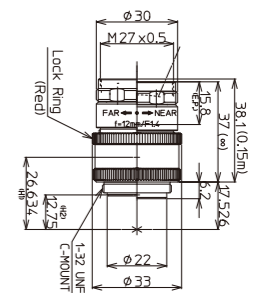
LM8JCM-V LM12JCM-V LM16JCM-V LM25JCM-V LM35JCM-V LM50JCM-V

LM8JCM-V



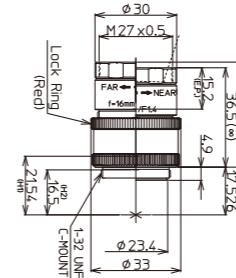
2/3" 1/1.8" 1/2" 8mm FIXED MEGA C-mt METAL RUGGED
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

LM12JCM-V



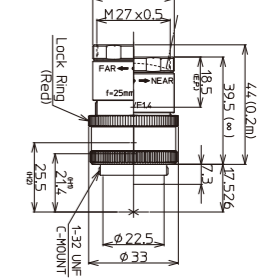
2/3" 1/1.8" 1/2" 12mm FIXED MEGA C-mt METAL RUGGED
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

LM16JCM-V



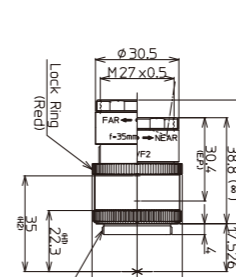
2/3" 1/1.8" 1/2" 16mm FIXED MEGA C-mt METAL RUGGED
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

LM25JCM-V



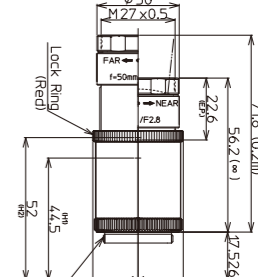
2/3" 1/1.8" 1/2" 25mm FIXED MEGA C-mt METAL RUGGED
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

LM35JCM-V



2/3" 1/1.8" 1/2" 35mm FIXED MEGA C-mt METAL RUGGED
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

LM50JCM-V



2/3" 1/1.8" 1/2" 50mm FIXED MEGA C-mt METAL RUGGED
Fixed Focal Megapixel C-mount Metal Body Ruggedized lens

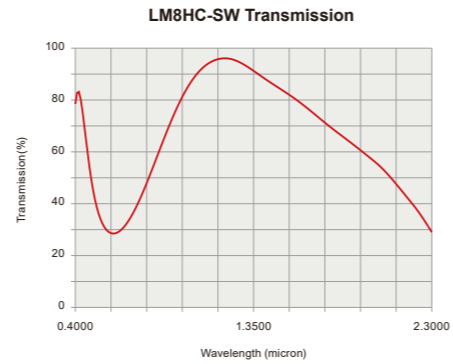
Model	LM8JCM-V	LM12JCM-V	LM16JCM-V	LM25JCM-V	LM35JCM-V	LM50JCM-V
Focal Length (mm)	8	12	16	25	35	50
Image Size (mm)	8.8×6.6 (Φ11)	8.8×6.6 (Φ11)	8.8×6.6 (Φ11)	8.8×6.6 (Φ11)	8.8×6.6 (Φ11)	8.8×6.6 (Φ11)
Iris Range (F-stop)	F1.4/F4/F8/F16	F1.4/F4/F8/F16	F1.4/F4/F8/F16	F1.4/F4/F8/F16	F2.8/F4/F8/F16	F2.8/F4/F8/F16
Focusing Range (m)	0.1~∞	0.15~∞	0.2~∞	0.2~∞	0.2~∞	0.2~∞
Control	Iris	-	-	-	-	-
Focus	Manual	Manual	Manual	Manual	Manual	Manual
Shooting Range at M.O.D. (mm)	120.3(H)×90.0(V)	110.0(H)×82.5(V)	112.8(H)×84.4(V)	71.1(H)×53.3(V)	47.9(H)×35.8(V)	29.3(H)×21.9(V)
Angle of View	2/3 Inch 56.5×43.9	38.3×29.1	30.0×22.7	19.6×14.8	14.4×10.8	9.6×7.2
View (Degrees)	1/1.8 Inch 47.4×36.3	31.7×24.0	24.7×18.6	16.1×12.1	11.8×8.8	7.9×5.9
	1/2 Inch 42.6×32.5	28.3×21.4	21.8×16.4	14.0×10.5	10.5×7.9	7.0×5.2
TV Distortion (%)	-0.6	-0.07	-0.05	-0.04	-0.2	-0.03
Back Focus in Air(mm)	9.74	11.7	13.1	11.7	20.1	35.5
Mount	C-mount	C-mount	C-mount	C-mount	C-mount	C-mount
Filter Thread (mm)	M27×P0.5	M27×P0.5	M27×P0.5	M27×P0.5	M27×P0.5	M27×P0.5
Size (mm)	Φ33.0×41.6	Φ33.0×37.0	Φ33.0×36.5	Φ33.0×39.5	Φ33.0×38.8	Φ33.0×56.2
Weight(g)	88	75	76.5	83	72.5	85
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

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† Images may differ from the actual product.

HC-SW Series

- ▶ Incorporating Kowa's special coating technology, the 1" format HC-SW series will maintains high transmission from 800nm to 1900nm.
- ▶ Designed for Near Infrared(NIR) and Short Wavelength Infrared (SWIR) applications.



LM8HC-SW



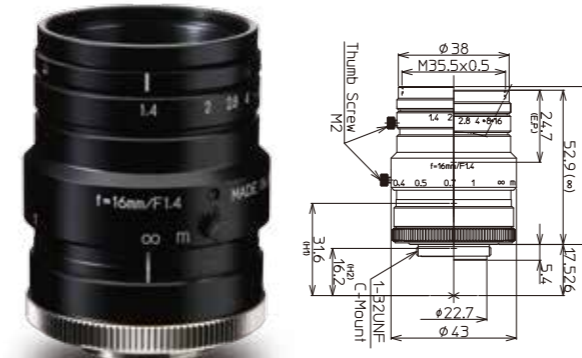
Model	LM8HC-SW
Focal Length(mm)	8
Image Size(mm)	12.8×9.6(Φ16)
Iris Range(F-stop)	F1.4~F16
Focusing Range(m)	0.1~∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	196.0(H)×143.2(V)
Angle of View	1 Inch: 79.4×63.0 2/3 Inch: 58.3×44.7 1/1.8 Inch: 48.5×36.9
TV Distortion(%)	-1.2
Back Focus in Air(mm)	11.2
Mount	C-mount
Filter Thread(mm)	M55×P0.75
Size(mm)	Φ57×58
Weight(g)	205
Temperature Range	-10°C~+50°C

LM12HC-SW

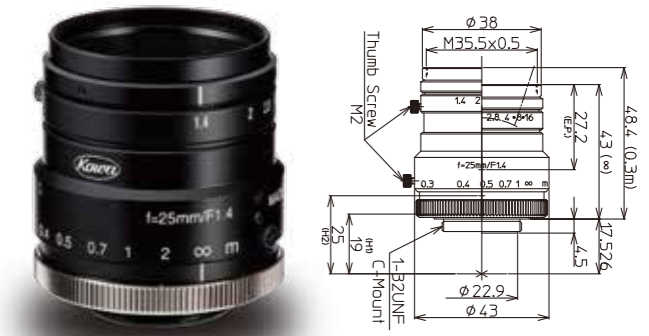


Model	LM12HC-SW
Focal Length(mm)	12.5
Image Size(mm)	12.8×9.6(Φ16)
Iris Range(F-stop)	F1.4~F16
Focusing Range(m)	0.3~∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	330.6(H)×243.5(V)
Angle of View	1 Inch: 55.6×42.5 2/3 Inch: 39.1×29.5 1/1.8 Inch: 32.1×24.2
TV Distortion(%)	-1.6
Back Focus in Air(mm)	12.6
Mount	C-mount
Filter Thread(mm)	M35.5×P0.5
Size(mm)	Φ43×51.5
Weight(g)	160
Temperature Range	-10°C~+50°C

LM16HC-SW



LM25HC-SW



LM35HC-SW



LM50HC-SW



Model	LM16HC-SW	LM25HC-SW	LM35HC-SW	LM50HC-SW
Focal Length(mm)	16	25	35	50
Image Size(mm)	12.8×9.6(Φ16)	12.8×9.6(Φ16)	12.8×9.6(Φ16)	12.8×9.6(Φ16)
Iris Range(F-stop)	F1.4~F16	F1.4~F16	F1.4~F16	F1.4~F16
Focusing Range(m)	0.3~∞	0.3~∞	0.3~∞	0.5~∞
Control	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	251.5(H)×186.2(V)	160.7(H)×119.2(V)	110.1(H)×82.0(V)	121.8(H)×91.3(V)
Angle of View	1 inch: 44.3×33.6 2/3 inch: 30.8×23.2 1/1.8 inch: 25.3×19.0	1 inch: 29.3×22.0 2/3 inch: 20.2×15.1 1/1.8 inch: 16.5×12.4	1 inch: 20.9×15.8 2/3 inch: 14.4×10.8 1/1.8 inch: 11.8×8.8	1 inch: 14.5×10.8 2/3 inch: 10.0×7.5 1/1.8 inch: 8.2×6.2
TV Distortion(%)	-1.0	-1.0	-0.5	0.05
Back Focus in Air(mm)	12.6	16.5	16.8	14.8
Mount	C-mount	C-mount	C-mount	C-mount
Filter Thread(mm)	M35.5×P0.5	M35.5×P0.5	M35.5×P0.5	M40.5×P0.5
Size(mm)	Φ43×52.9	Φ43×43	Φ43×43	Φ49×48
Weight(g)	150	135	135	210
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

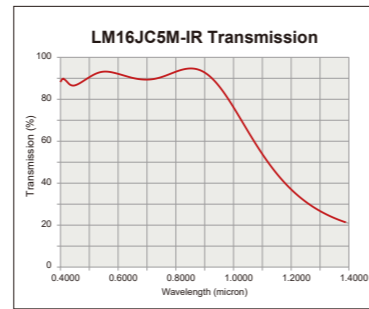
† Images may differ from the actual product.

† Images may differ from the actual product.

LM16JC5M-IR LM25JC5M-IR LM35JC5M-IR

JC5M-IR Series NEW

- ▶ 5 megapixel lens
- ▶ IR corrected design
- ▶ Fast F-stop of F1.4 *LM35JC5M-IR is F2.0
- ▶ Low distortion
- ▶ Manual-Iris, Auto-Iris and P-iris versions available



LM16JC5M-IR NEW

16mm FIXED 5MEGA METAL LO-DIS IR

LM25JC5M-IR NEW

25mm FIXED 5MEGA METAL LO-DIS IR

LM35JC5M-IR NEW

35mm FIXED 5MEGA METAL LO-DIS IR

Model	LM16JC5M-IR	LM25JC5M-IR	LM35JC5M-IR
Focal Length(mm)	16	25	35
Image Size(mm)	8.8×6.6(Φ11)	8.8×6.6(Φ11)	8.8×6.6(Φ11)
Iris Range(F-stop)	F1.4~F16	F1.4~F16	F2.0~F22
Focusing Range(m)	0.3~∞	0.3~∞	0.3~∞
Control	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	171.4(H)×127.4(V)	113.3(H)×84.5(V)	75.8(H)×56.6(V)
Angle of View	2/3 Inch: 30.9×23.2 1/1.8 Inch: 25.4×19.0 1/2 Inch: 22.6×16.9	20.1×15.1 16.5×12.4 14.6×11.0	13.9×10.5 11.4×8.3 10.2×7.6
TV Distortion(%)	-0.8	-0.3	-0.3
Back Focus in Air(mm)	14.7	12	19.2
Mount	C-mount	C-mount	C-mount
Filter Thread(mm)	M27×P0.5	M30.5×P0.5	M30.5×P0.5
Size(mm)	Φ34.0×44.5	Φ34.0×47.0	Φ34.0×43.0
Weight(g)	100	110	100
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

LM50HC-IR LM60HC-IR

HC-IR Series NEW

- ▶ IR corrected design
- ▶ Excellent corner brightness
- ▶ High performance compact lens
- ▶ Low distortion

NEW LM50HC-IR

50mm FIXED MEGA METAL LO-DIS IR

NEW LM60HC-IR

60mm FIXED MEGA METAL LO-DIS IR

Model	LM50HC-IR	LM60HC-IR
Focal Length(mm)	50	60
Image Size(mm)	12.8×9.6(Φ16)	12.8×9.6(Φ16)
Iris Range(F-stop)	F1.8~F16	F2.0~F16
Focusing Range(m)	1.0~∞	1.0~∞
Control	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	246.0(H)×184.0(V)	216.9(H)×162.1(V)
Angle of View	1 Inch: 14.4×10.8 2/3 Inch: 9.9×7.5 1/1.8 Inch: 8.2×6.2	12.2×9.2 8.4×6.3 6.9×5.2
TV Distortion(%)	-0.09	-0.06
Back Focus in Air(mm)	20.4	15.7
Mount	C-mount	C-mount
Filter Thread(mm)	—	M37.5×P0.5
Size(mm)	Φ50.0×47.4	Φ49.2×54.6
Weight(g)	180	200
Temperature Range	-10°C~+50°C	-10°C~+50°C

LARGE FORMAT NIR Broad Band Large Format Lens (Visible+NIR+DAY/NIGHT)

- ▶ IR corrected design
- ▶ Broad band coating
- ▶ Bright F-stop of F1.9
- ▶ F-mount & P-mount(M42×1)

- Application**
- Solar panel inspection
 - Visible/NIR line scan
 - ITS
 - Large format area scan

LM50-IR

50mm FIXED MEGA METAL LO-DIS IR

LM65-IR

65mm FIXED MEGA METAL LO-DIS IR

Model	LM50-IR	LM65-IR
Focal Length(mm)	50	65
Image Size(mm)	43.3(Φ43.3)	43.3(Φ43.3)
Iris Range(F-stop)	F1.9~F16	F1.9~F16
Focusing Range(m)	0.5~∞	0.7~∞
Control	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	366.9(H)×242.9(V)	313.6(H)×209.8(V)
Angle of View	Full Size: 40.2×27.2 4/3 Inch: 21.0×15.8 1 Inch: 14.6×11.0	31.9×21.7 16.4×12.3 11.7×8.8
TV Distortion(%)	-0.5	0.7
Back Focus in Air(mm)	34.6	34.6
Mount	Nikon F-mount	Nikon F-mount
Filter Thread(mm)	M52×P0.75	M67×P0.75
Size(mm)	Φ58.5×105.2	Φ69×105.1
Weight(g)	605	650
Temperature Range	-10°C~+50°C	-10°C~+50°C

Reduction of visible-NIR focus shift

Visible design lens

NIR

IR Corrected design lens

Visible

Wavelength Change

Examples

Visible

NIR

† Images may differ from the actual product.

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LINE SCAN

LM28LF LM35LF LM50LF LM28CLS LM35CLS LM50CLS

LF Series

- ▶ Large format (Image size $\Phi 46.0\text{mm}$)
- ▶ Corresponds to 4K Line Scan Camera
- ▶ Low distortion
- ▶ Suitable for close distance inspection

Optimized design for machine vision

LM28LF



LM35LF



LM50LF



28mm FIXED METAL LO-DIS
Fixed Focal Metal Body Low Distortion

35mm FIXED METAL LO-DIS
Fixed Focal Metal Body Low Distortion

50mm FIXED METAL LO-DIS
Fixed Focal Metal Body Low Distortion

Model	LM28LF	LM28LF-48	LM35LF	LM35LF-48	LM50LF	LM50LF-48
Focal Length(mm)	28		35		50	
Image Size(mm)	46.0($\Phi 46$)		46.0($\Phi 46$)		46.0($\Phi 46$)	
Iris Range(F-stop)	F2.8-F22		F2.8-F22		F2.8-F22	
Focusing Range(m)	0.5- ∞		0.4- ∞		0.4- ∞	
Control	Iris: Manual Focus: Manual		Iris: Manual Focus: Manual		Iris: Manual Focus: Manual	
Shooting Range at M.O.D.(mm)	424.3x281.1		239.9x160.3		162.9x108.9	
Angle of View	Full size: 64.6x45.8 4/3 inch: 35.8x27.2 1 inch: 25.3x19.1		53.7x37.2 28.9x21.8 20.3x15.3		39.7x27.1 20.9x15.7 14.6x11.0	
TV Distortion(%)	-0.17		-0.15		-0.04	
Flange Back in Air(mm)	46.5	17.5	46.5	17.5	46.5	17.5
Mount	Nikon F-mount TFL-II mount	TFL-II mount	Nikon F-mount TFL-II mount	TFL-II mount	Nikon F-mount TFL-II mount	TFL-II mount
Filter Thread(mm)	M72xP0.75		M52xP0.75		M52xP0.75	
Size(mm)	$\Phi 75 \times 98$	$\Phi 75 \times 127$	$\Phi 57.5 \times 71$	$\Phi 57.5 \times 100$	$\Phi 57.5 \times 77$	$\Phi 57.5 \times 106$
Weight(g)	500		430		470	

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CLS Series

- ▶ For industrial 3CCD color line scan camera
- ▶ Ultra high resolution
- ▶ For use with 30mm length line sensor
- ▶ Low chromatic aberration
- ▶ Close up lens is available for close distance applications
- ▶ Excellent corner brightness

LM28CLS



LM35CLS



LM50CLS



28mm FIXED 3CCD METAL
Fixed Focal 3CCD Camera Metal Body

35mm FIXED 3CCD METAL
Fixed Focal 3CCD Camera Metal Body

50mm FIXED 3CCD METAL
Fixed Focal 3CCD Camera Metal Body

Model	LM28CLS	LM35CLS	LM50CLS
Focal Length(mm)	28	35	50
Image Size(mm)	30.0($\Phi 30$)	30.0($\Phi 30$)	30.0($\Phi 30$)
Iris Range(F-stop)	F2.8-F22	F2.8-F22	F2.8-F22
Focusing Range(m)	0.5- ∞	0.5- ∞	0.5- ∞
Control	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	317.9(V)	259.1(V)	157.7(V)
Angle of View(Degrees)	55.2(V)	46.1(V)	32.3(V)
TV Distortion(%)	-0.1	0.06	-0.1
Flange Back in Air(mm)	46.5	46.5	46.5
Mount	Nikon F-mount	Nikon F-mount	Nikon F-mount
Filter Thread(mm)	M72xP0.75	M62xP0.75	M52xP0.75
Size(mm)	$\Phi 75 \times 108$	$\Phi 65 \times 108$	$\Phi 58 \times 63.5$
Weight(g)	482	480	358

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† Images may differ from the actual product.

1/3" NF-MOUNT

Compact NF-mt. lens Series

- ▶ Introducing the lineup of megapixel NF-mount lenses. The compact body and high resolution design will maximize the performance of NF-mount camera.

LM3NF



1/3" 2.7mm FIXED MEGA NF-mt METAL
Fixed Focal Megapixel NF-mount Metal Body

Model	LM3NF
Focal Length(mm)	2.7
Image Size(mm)	4.8x3.6($\Phi 6$)
Iris Range(F-stop)	F1.8-F11
Focusing Range(m)	0.1- ∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	262.7(H)x167.8(V)
Angle of View(Degrees) 1/3 Inch	102.3x76.7
TV Distortion(%)	-7.3
Back Focus in Air(mm)	7.8
Mount	NF-mount
Size(mm)	$\Phi 21 \times 27$
Weight(g)	30
Temperature Range	-10°C~+50°C

LM5NF



1/3" 4.5mm FIXED MEGA NF-mt METAL
Fixed Focal Megapixel NF-mount Metal Body

Model	LM5NF
Focal Length(mm)	4.5
Image Size(mm)	4.8x3.6($\Phi 6$)
Iris Range(F-stop)	F1.8-F11
Focusing Range(m)	0.1- ∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	122.9(H)x89.9(V)
Angle of View(Degrees) 1/3 Inch	59.2x45.0
TV Distortion(%)	-2.8
Back Focus in Air(mm)	8.1
Mount	NF-mount
Size(mm)	$\Phi 21 \times 31$
Weight(g)	35
Temperature Range	-10°C~+50°C

LM9NF



1/3" 9mm FIXED MEGA NF-mt METAL
Fixed Focal Megapixel NF-mount Metal Body

Model	LM9NF
Focal Length(mm)	9
Image Size(mm)	4.8x3.6($\Phi 6$)
Iris Range(F-stop)	F1.8-F11
Focusing Range(m)	0.1- ∞
Control	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	58.1(H)x43.3(V)
Angle of View(Degrees) 1/3 Inch	30.2x22.8
TV Distortion(%)	-0.6
Back Focus in Air(mm)	8.6
Mount	NF-mount
Size(mm)	$\Phi 22 \times 34$
Weight(g)	40
Temperature Range	-10°C~+50°C

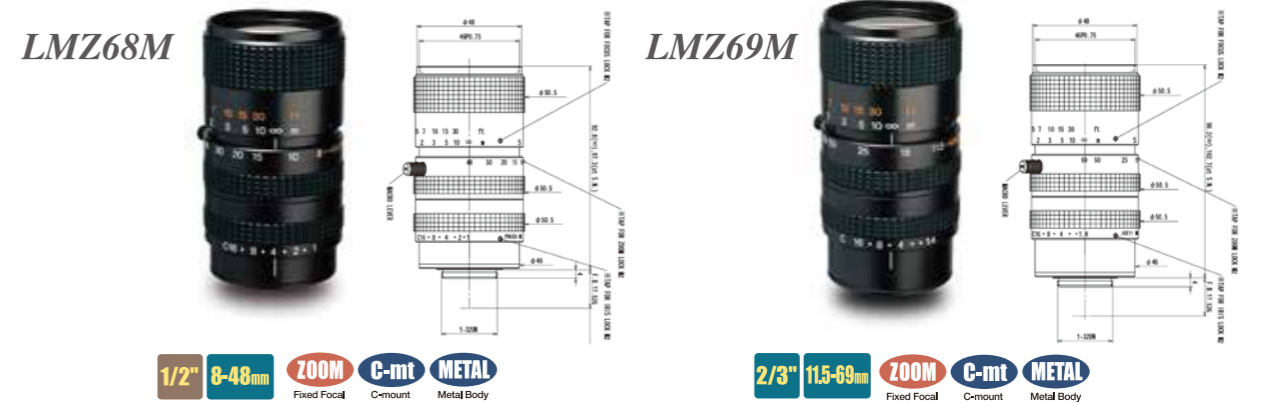
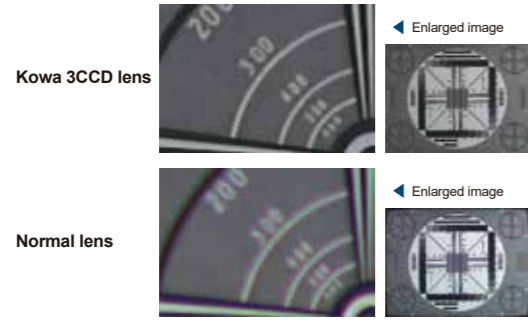
† Images may differ from the actual product.

NC3 Series

- ▶ For megapixel applications
- ▶ For megapixel applications
- ▶ Excellent corner brightness
- ▶ Wide product range: 5 lenses in series
- ▶ Low distortion
- ▶ Low chromatic aberration

- ▶ 2 zoom ranges (6× and 10×)
- ▶ Excellent for pattern matching, measurement, inspection, and character recognition

Quality comparison between Kowa 3CCD lens and normal lens



Model	LM4NC3	LM6NC3	LM12NC3	LM25NC3	LM50NC3
Focal Length(mm)	4	6	12	25	50
Image Size(mm)	6.4x4.5(Φ8)	6.4x4.5(Φ8)	6.4x4.5(Φ8)	6.4x4.5(Φ8)	6.4x4.5(Φ8)
Iris Range(F-stop)	F1.8-F16	F1.8-F16	F1.8-F16	F1.8-F16	F1.8-F16
Focusing Range(m)	0.1-∞	0.1-∞	0.15-∞	0.2-∞	0.3-∞
Control	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual	Iris: Manual Focus: Manual
Shooting Range at M.O.D.(mm)	233.5(H)×163.4(V)	146.9(H)×107.2(V)	99.8(H)×74.0(V)	62.9(H)×57.0(V)	45.8(H)×34.3(V)
Angle of View	1/1.8 inch: 91.9×71.8 1/2 inch: 83.4×64.5 1/3 inch: 64.5×49.2	65.3×50.1 58.8×44.9 45.7×33.9	34.1×25.7 30.4×22.8 22.8×17.2	16.4×12.3 14.6×11.0 11.0×8.2	7.9×5.9 7.0×5.3 5.3×4.0
Resolution(Center, Corner)	120lp/mm, 100lp/mm	120lp/mm, 100lp/mm	120lp/mm, 100lp/mm	120lp/mm, 100lp/mm	120lp/mm, 100lp/mm
TV Distortion(%)	-5.0	-2.4	-1.2	-0.17	0.02
Back Focus in Air(mm)	14.7	15.2	15.2	15.0	21.2
Mount	C-mount	C-mount	C-mount	C-mount	C-mount
Filter Thread(mm)	M46×P0.75	M37.5×P0.5	M27×P0.5	M27×P0.5	M35.5×P0.5
Size(mm)	Φ48×68.7	Φ39×64.3	Φ30×58.5	Φ30×47	Φ40×66
Weight(g)	120	105	95	80	160
Temperature Range	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C	-10°C~+50°C

† Images may differ from the actual product.

Model	LMZ50M	LMZ45T3
Magnification	inf~0.7x	inf~1.1x
Zoom Magnification	10x	6x
Image Size(mm)	4.8x3.6(Φ6)	8.8x6.6(Φ11)
Close up lens	3Dpt.un-installed	3Dpt.un-installed
Shooting Magnification	Inf-0.28x	0.07-0.7x
W.D (mm)	Inf-M.O.D=310	WD=310-150
Iris Range(F-stop)	F2.5~Close	F2.5~Close
Object side N.A.	-	-
Image side N.A.	-	-
TV Distortion(%)	0.1	0.1
Angle of View(Degrees)	inf wide inf tele WD=185 wide WD=185 tele	27.3×20.5° 4.7×3.5° 67.0×50.1 11.7×9.0
2/3 inch	-	inf wide inf tele WD=185 wide WD=185 tele
1/2 inch	-	19.9×14.9° 3.4×2.6° 48.6×36.5 8.7×6.6
1/3 inch	inf wide inf tele WD=310 wide WD=310 tele	14.9×11.2° 2.6×2.0° 36.5×27.3 6.6×5.0
Mount	C-mount	C-mount
Control	Iris: Manual Focus: Manual Zoom: Manual	Iris: Manual Focus: Manual Zoom: Manual
Filter Thread(mm)	M48×P0.75	M52×P0.75
Size(mm)	Φ60×130	Φ62×171.7
Weight(g)	437	595
Temperature Range	-10°C~+50°C	-10°C~+50°C

Model	LMZ68M	LMZ69M
Focal Length(mm)	8-48(6x)	11.5-69(6x)
Image Size(mm)	6.4x4.8(Φ8)	8.8x6.6(Φ11)
Iris Range(F-stop)	F1.0~Close	F1.4~Close
Focusing Range(m)	1.0-∞	1.0-∞
(Macro)	0.01	0.01
Control	Iris: Manual Focus: Manual Zoom: Manual	Iris: Manual Focus: Manual Zoom: Manual
Angle of View(Degrees)	W43.6×33.4/T7.7×5.7	W41.9×32.0/T7.3×5.5
Mount	C-mount	C-mount
Filter Thread(mm)	M46×0.75	M46×0.75
Size(mm)	Φ50.5×92.8	Φ50.5×98.2
Weight(g)	280	300
Temperature Range	-10°C~+50°C	-10°C~+50°C

† Images may differ from the actual product.

4/3" 8 MEGA 1" 6 MEGA 1" MEGA FLUG 10 MEGA 5 MEGA 3 MEGA WIDE MEGA 2/3" MEGA 2/3" FLUG 2/3" UC 1/1.8" NCL SWIR NIR NIE SCAN NIE SCAN NIE SCAN NIE SCAN 3CCD NCL MACRO TECHNIC VARIOCAL OTHERS

TELECENTRIC Series

High Resolution Lenses

Features of TC Series

- ▶ Produces high contrast and resolution in both the center and corners.
- ▶ Virtually no TV distortion of entire image area.

4/3" MACRO ZOOM 21 MEGAPIXEL

LM1119TC (0.5~1.0×)

4/3" MACRO 21 MEGAPIXEL

LM1138TC (2.0×)

2/3" 5 MEGAPIXEL PLUS

LM1120TC (3.45~4.4×)

LM1121TC (1.725~2.2×)

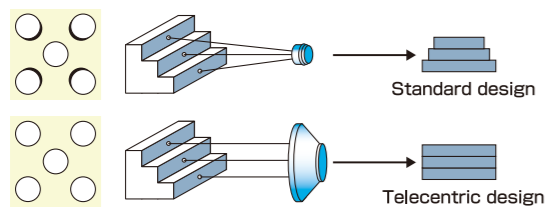
LM1122TC (1.15~1.47×)

LM1123TC (0.69~0.88×)

LM1125TC (0.346~0.44×)

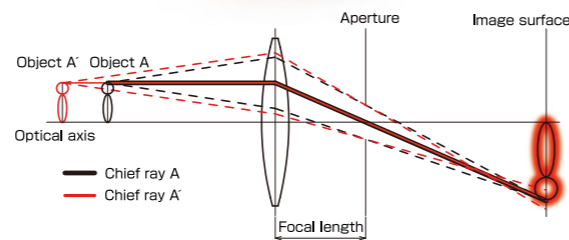
2/3" MACRO ZOOM

LM50TC (0.3~1.0×)



Telecentric Optical System

In a telecentric optical system, there is no change in magnification when focusing. Thus, the magnification remains constant at different working distances. Similarly, the movement of an object also does not change the magnification, which makes a telecentric lens ideal for measuring objects with high accuracy. In a telecentric optical system, the chief rays are parallel to the optical axis. As a result, the aperture becomes greater as the magnification is fixed by the focusing rays. This means that the F-number on a telecentric lens tends to be larger when compared to a standard megapixel lens.



Application Examples

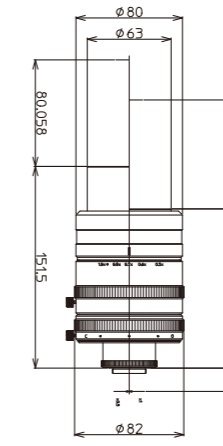
- ▶ Surface inspection of silicon wafers
- ▶ Image defect inspections
- ▶ Inspection of dirt on prisms and glass circuit boards
- ▶ Measurement of thread pitches
- ▶ Reading 2D codes

† Images may differ from the actual product.

4/3" MACRO ZOOM 21 MEGAPIXEL

- ▶ Telecentric lens with variable magnification
- ▶ Able to resolve up to 21 megapixels
- ▶ 0.5×~1.0× for macro use

LM1119TC

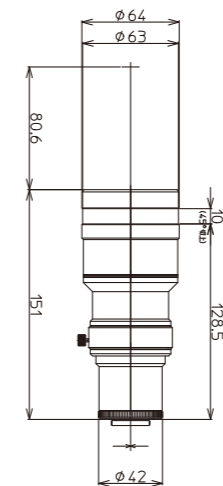


Model	LM1119TC	
Magnification	0.5~1.0×	
Image Size	18.4×13.8(Φ23)	
Shooting Magnification	0.5×	1.0×
Objective N.A.	0.05	0.1
W.D(mm)	80	81.8
Shooting Range (mm)	4/3 inch	36.8×27.6
	1 inch	25.6×19.2
	2/3 inch	17.6×13.2
TV Distortion(%)	0.1	0.1
Back Focus in Air(mm)	14.7	
Mount	C-mount	
Resolution	120lp/mm	
Size	Φ82×151.5	
Weight(g)	1000	
Temperature Range	-10°C~+50°C	
Storage Temperature Range	-20°C~+60°C	

4/3" MACRO 21 MEGAPIXEL

- ▶ 2.0x for macro use
- ▶ Able to resolve up to 21 megapixels

LM1138TC



Model	LM1138TC	
Magnification	2.0×	
Image Size	18.4×13.8(Φ23)	
Shooting Magnification	2.0×	
Objective N.A.	0.2	
W.D(mm)	80.6	
Shooting Range (mm)	4/3 inch	9.20×6.90
	1 inch	6.40×4.8
	2/3 inch	4.4×3.3
TV Distortion(%)	0.1	
Back Focus in Air(mm)	15.0	
Mount	C-mount	
Resolution	120lp/mm	
Size	Φ64×151.0	
Weight(g)	830	
Temperature Range	-10°C~+50°C	
Storage Temperature Range	-20°C~+60°C	

† Images may differ from the actual product.

2/3" TELECENTRIC 5 MEGAPIXEL PLUS

- ▶ Telecentric lens with variable magnification
- ▶ Able to adjust the magnification to match with the pixel size of the camera
- ▶ Lenses are designed with an optical magnification that is ideal for over 5 megapixels
- ▶ Distortion free lenses of less than 0.02%. TV distortion is limited to 0.25% on the entire image area even when used with a 5 megapixel camera

LM1120TC



Model		LM1120TC		
Magnification		3.45~4.4x		
Image Size		8.8×6.6(Φ11)		
Shooting Magnification		3.45x	4.0x	4.4x
Objective N.A.		0.2	0.2	0.2
W.D(mm)		65.9	65.9	65.9
Shooting Range (mm)	2/3 inch	1.9×2.6	1.7×2.2	1.5×2.0
	1/1.8 inch	1.6×2.1	1.4×1.8	1.2×1.6
	1/2 inch	1.4×1.9	1.2×1.6	1.1×1.5
TV Distortion(%)		0.015	0.003	-0.002
Back Focus in Air(mm)		17.1	24.5	30
Mount		C-mount		
Resolution		120lp/mm		
Size(mm)		Φ57×180.0		
Weight(g)		645		
Temperature Range		-10°C~+50°C		
Storage Temperature Range		-20°C~+60°C		

LM1121TC



Model		LM1121TC		
Magnification		1.725~2.2x		
Image Size		8.8×6.6(Φ11)		
Shooting Magnification		1.725x	2.0x	2.2x
Objective N.A.		0.131	0.131	0.131
W.D(mm)		114.8	111.4	109.4
Shooting Range (mm)	2/3 inch	5.1×3.8	4.4×3.3	4.0×3.0
	1/1.8 inch	4.2×3.1	3.6×2.7	3.3×2.4
	1/2 inch	3.7×2.8	3.2×2.4	2.9×2.2
TV Distortion(%)		0.011	0.004	0.001
Back Focus in Air(mm)		55.8	67.7	76.3
Mount		C-mount		
Resolution		120lp/mm		
Size(mm)		Φ48×147.5		
Weight(g)		420		
Temperature Range		-10°C~+50°C		
Storage Temperature Range		-20°C~+60°C		

LM1122TC



Model		LM1122TC		
Magnification		1.15~1.47x		
Image Size		8.8×6.6(Φ11)		
Shooting Magnification		1.15x	1.3x	1.47x
Objective N.A.		0.101	0.101	0.101
W.D(mm)		111.6	111.6	111.6
Shooting Range (mm)	2/3 inch	7.6×5.7	6.6×5.0	6.0×4.5
	1/1.8 inch	6.3×4.7	5.5×4.1	4.9×3.7
	1/2 inch	5.6×4.2	4.9×3.7	4.3×3.3
TV Distortion(%)		-0.015	-0.001	0.011
Back Focus in Air(mm)		18.7	23.6	29.8
Mount		C-mount		
Resolution		120lp/mm		
Size(mm)		Φ50×123.9		
Weight(g)		330		
Temperature Range		-10°C~+50°C		
Storage Temperature Range		-20°C~+60°C		

LM1123TC



Model		LM1123TC		
Magnification		0.69~0.88x		
Image Size		8.8×6.6(Φ11)		
Shooting Magnification		0.69x	0.8x	0.88x
Objective N.A.		0.07	0.07	0.07
W.D(mm)		111.0	111.0	111.0
Shooting Range (mm)	2/3 inch	12.7×9.6	11.0×8.2	10.0×7.5
	1/1.8 inch	10.4×7.8	9.0×6.7	8.2×6.1
	1/2 inch	9.3×7.0	8.0×6.0	7.3×5.5
TV Distortion(%)		-0.001	-0.009	0.005
Back Focus in Air(mm)		34	28.8	25.3
Mount		C-mount		
Resolution		120lp/mm		
Size(mm)		Φ50×121.5		
Weight(g)		290		
Temperature Range		-10°C~+50°C		
Storage Temperature Range		-20°C~+60°C		

LM1125TC



Model		LM1125TC		
Magnification		0.346~0.44x		
Image Size		8.8×6.6(Φ11)		
Shooting Magnification		0.346x	0.4x	0.44x
Objective N.A.		0.04	0.04	0.04
W.D(mm)		112.7	112.7	112.7
Shooting Range (mm)	2/3 inch	19.1×25.4	16.5×22.0	15.0×20.0
	1/1.8 inch	15.7×20.9	13.6×18.1	12.3×16.5
	1/2 inch	13.9×18.6	12.1×16.1	11.0×14.6
TV Distortion(%)		0.02	-0.009	0.01
Back Focus in Air(mm)		17.6	17	16.5
Mount		C-mount		
Resolution		120lp/mm		
Size(mm)		Φ51.5×142.3		
Weight(g)		395		
Temperature Range		-10°C~+50°C		
Storage Temperature Range		-20°C~+60°C		

2/3" MACRO ZOOM

- ▶ Telecentric lens with variable magnification
- ▶ 0.3x~1.0x for macro use

LM50TC



Model		LM50TC	
Magnification		0.3~1.0x	
Image Size		8.8×6.6(Φ11)	
Shooting Magnification		0.3x	1.0x
Objective N.A.		0.038	0.100
W.D(mm)		193.4	81.8
Shooting Range (mm)	2/3 inch	29.5×22.2	8.8×6.6
	1/1.8 inch	24.1×18.0	7.2×5.4
	1/2 inch	21.4×16.0	6.4×4.8
TV Distortion(%)		-0.19	-0.1
Back Focus in Air(mm)		22.0	
Mount		C-mount	
Resolution		120lp/mm	
Filter Thrad (mm)		M37.5×P0.5	
Size		Φ56×115.7	
Weight(g)		317	
Temperature Range		-10°C~+50°C	
Storage Temperature Range		-20°C~+60°C	

† Images may differ from the actual product.

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Various types of lenses are used in machine vision systems. In order to achieve the highest performance, it is important to select the lens most suitable for the application.

Product Number Breakdown Ex. **LM 12 JCM**

- ①Represents lens function
 - LM.....KOWA CCTV lenses
 - LMZ.....KOWA Zoom lenses
 - LMVZ.....KOWA Varifocal lenses
- ②Represents focal length (fixed focal length lenses)
- ③Represents format sizes and lens type
 - XC 4/3 inch format megapixel lens
 - CLS 3CCD color line scan lens
 - SC,HC 1 inch format megapixel lens
 - HC-SW 1 inch format SWIR lens
 - JC 2/3 inch format lens
 - JCM 2/3 inch format megapixel lens
 - NCL 1/2 inch format lens
 - NCM 1/2 inch format megapixel lens
 - M Macro lens
 - TC Telecentric lens
 - NC3 1/2 inch format 3CCD megapixel lens
 - IR IR-corrected lens
 - NF NF mount lens

Quick selection - How to calculate focal length

Ex) A 2/3" camera is used to capture an object 100mm wide from a distance of 300mm.
Use the picture below and the image size chart to substitute for Y, L, and Y'. Then, to capture the entire object, use the formula $f=L*Y'/Y$ to calculate focal length.

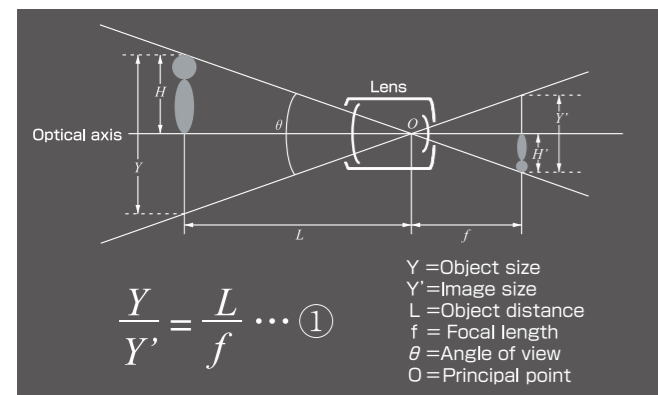
$Y=8.8\text{mm}$ (See image size chart), $L=300\text{mm}$, $Y=100\text{mm}$
 $f=300*8.8/100$
 $f=26.4\text{mm}$
 The most appropriate lens is f=25mm lens, which is close but not greater than the 26.4 derived from the calculation.
 Lenses with shorter focal lengths than the given number can capture an object in its entirety.

Quick selection - How to calculate the angle of view

Ex) A 1/2" camera is used to shoot an object 300mm away. The focal length of the lens is 16mm. Use the picture below and image size chart to substitute for f, L, and Y1 (H or V accordingly). Then to calculate the angle of view, use the formula $Y=L*Y'/f$.

Width- $Y=6.4\text{mm}$ (Horizontal), $f=16\text{mm}$, $L=300\text{mm}$
 $Y=300*6.4/16$
 $Y=120\text{mm}$
 Vertical- $Y=4.8\text{mm}$ (Vertical), $f=16\text{mm}$, $L=300\text{mm}$
 $Y=300*4.8/16$
 $Y=90\text{mm}$
 Thus in order to capture the object in its entirety, the maximum dimensions of an object at a distance of 300mm is 120mm wide and 90mm height.

Characteristics of lenses are described below

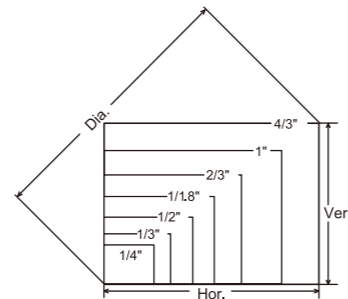


- Object size Field range which can be captured by the image sensor
- Image size See description
- Object distance Distance from the lens to the object
- Focal length Distance from the principal point to the focus point
- Angle of view This angle represents a shooting range in degrees. The shorter a focal length is, the bigger an angle of view is.
- Principal point Optical center of the lens

Image size

Image size represents size of camera sensor

Camera	Hor.(mm)	Ver.(mm)	Dia.(mm)
1/4 inch	3.6	2.7	4.5
1/3 inch	4.8	3.6	6
1/2 inch	6.4	4.8	8
1/1.8 inch	7.2	5.4	9
2/3 inch	8.8	6.6	11
1 inch	12.8	9.6	16
4/3 inch	18.4	13.8	23



F-number

The F-number represents the amount of light that passes through a lens. As the F-number decreases, the amount of light that passes through the lens increases. The F-number affects the depth of field as mentioned below.

Depth of field

Depth of field is the range of distance, in front of and behind a subject that appears in focus. If the depth of field is deep, an object will appear to be in focus even if it moves slightly back and forth.

The characteristics of depth of field (comparing lenses with the same specifications)

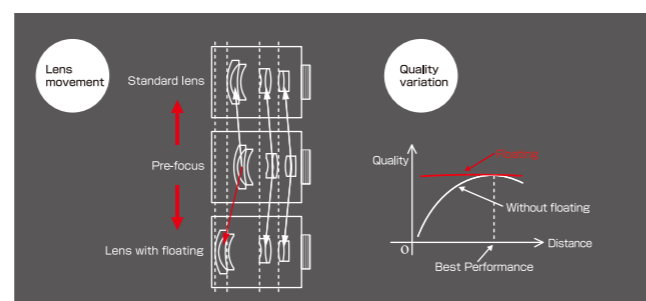
- Increasing the F-number (darker) increases the depth.
- Shortening the focal length increases the depth.
- Lengthening the object distance increases the depth.

Floating Mechanism system

The floating mechanism system is effective in preventing malfunction and increasing the life of the lens. It is also called the close distance aberration compensation mechanism.

In standard CCTV lenses, the whole or a part of the lens moves when focusing. However, moving one lens element and not the entire lens system changes the direction of the light rays and decreases the optical performance.

However, lenses with the floating mechanism system can vary the distance between the lens elements. This enables the lens to achieve the highest performance at various objective distances.



Lens processing facility

Kowa has the facility to manufacture any optical device with the requested specifications.

Examples of optical devices

- Parabolic mirrors
- Plastic molded lenses
- Germanium lenses
- Special filters
- Aspherical Lenses



Coating machine



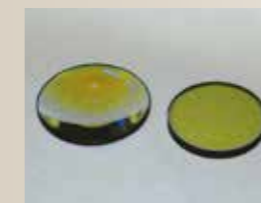
Aspherical lens processing machine



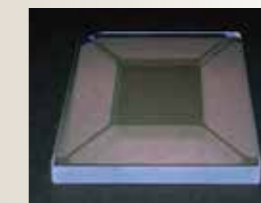
Ultra-precision processing machine



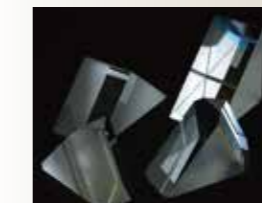
Spherical and Aspherical lenses



YAG laser cut optical devices



Special mirrors



Various prisms



Optical devices with special coatings



Ultra-precision optical devices

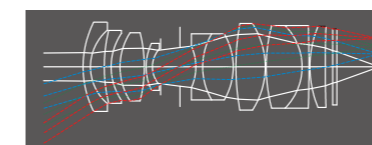
Design & Development

OEM Product Design

Kowa has the ability to create an OEM customized optical system, which includes the optical, mechanical, electrical and software design. We will provide you the best solution for every customer who requires high-end customized products.

Example of Customized Optics

- Optics for Medical X-ray diagnostics
- Optics for Semiconductor instruments
- Optics for laser scanning applications
- Optics for surveillance applications
- Optics for printing applications



Kowa will provide suggestions about the customized optics based on the flow chart below.

