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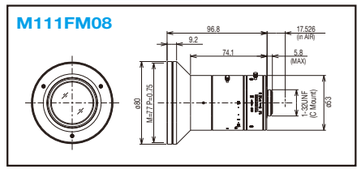
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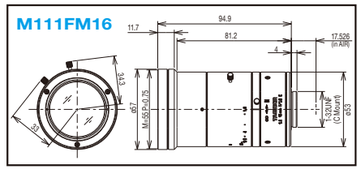
DIMENSIONS

1.1" 3.1µm pixel pitch

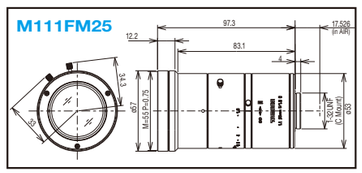
M111FM08



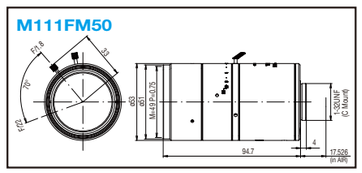
M111FM16



M111FM25

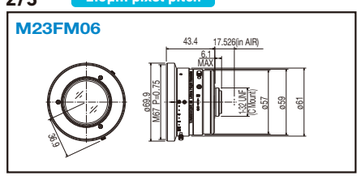


M111FM50

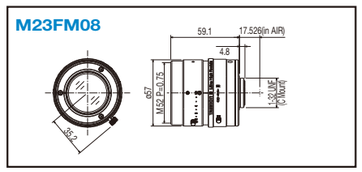


2/3" 2.5µm pixel pitch

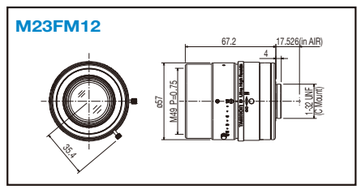
M23FM06



M23FM08

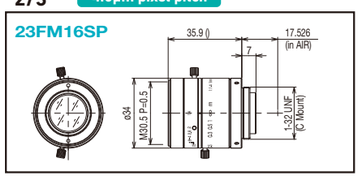


M23FM12

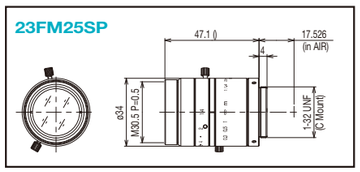


2/3" 4.0µm pixel pitch

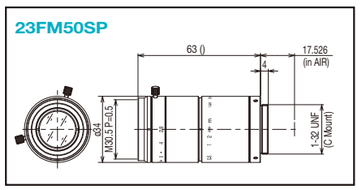
23FM16SP



23FM25SP

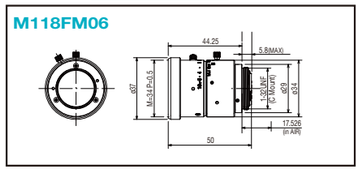


23FM50SP

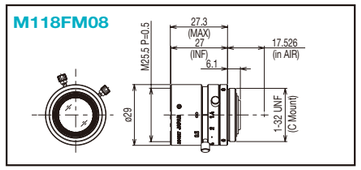


1/1.8" 4.0µm pixel pitch

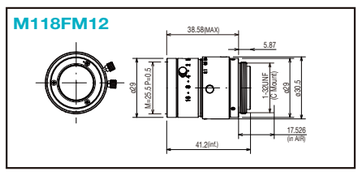
M118FM06



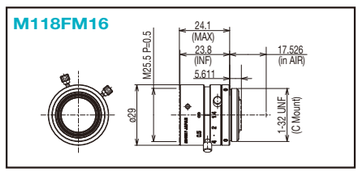
M118FM08



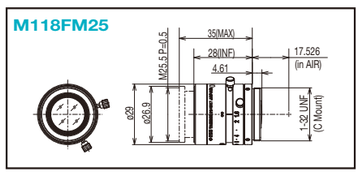
M118FM12



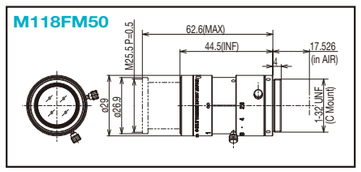
M118FM16



M118FM25



M118FM50



⚠ **Caution : Please read the instruction manual carefully before using the camera.**

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Management on Quality and Environment
Tamron is certified with international standards: ISO 9001 for quality and ISO14001 for environmental management at its headquarters, domestic sales offices, China plant as well as three production facilities in Aomori,Japan,and is fully committed to striving for continued and sustainable improvementat all levels and facets of its business operations.

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TAMRON

Mega-Pixel Machine Vision Lens Series

Fixed-Focal Machine Vision Lens Series



These Ultra-High-Resolution Lenses deliver outstanding optical quality with enhanced performance from center to periphery of the image. The best choice for Machine Vision and FA (Factory Automation) applications.

- High-Performance
- Minimized Distortion
- Enhanced Performance in the Close-Focus Range

E

Fixed-Focal Machine Vision Lens Series

Machine vision lenses featuring superior optical technology
Tamron's Mega-Pixel Machine Vision Lens Series provides outstanding optical quality and enhanced performance in close-focus situations and meets the needs of diverse image processing applications

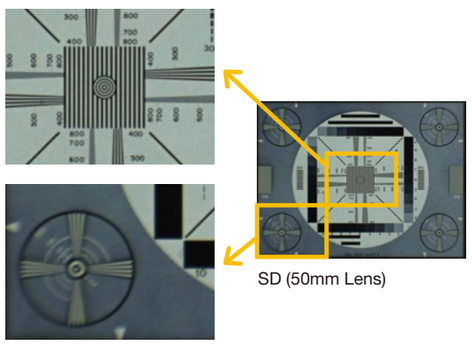
1.1" Ultra-High-Performance Machine Vision Fixed-Focal Lenses

Compatible with MP camera: 1.1" cameras, 1" cameras
3.1µm pixel pitch: 1/1.2" cameras, 2/3" cameras, 1/1.8" cameras

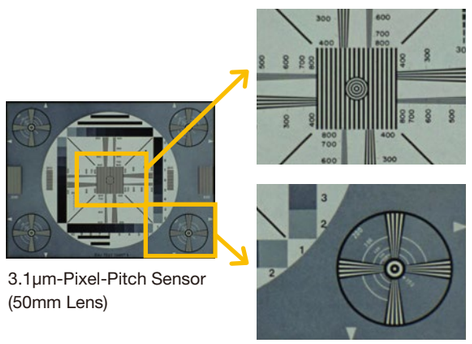
3.1µm

Industry-Leading High Contrast and Resolution

The lenses, are optimized for 3.1-µm-pixel-pitch imagers, equivalent to 1.1" 12 mega-pixels. Use of state-of-the-art optical technology enables high-contrast and high-resolution from the corner to the periphery of images despite the large aperture size. Tamron's machine vision fixed-focal lens line-up also opens gates to other areas of applications including traffic monitoring, notably for ITS (Intelligent Transport Systems).



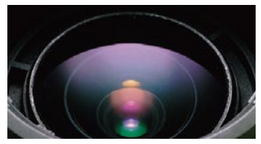
5MP Camera + SD Lens
= Not Enough Resolution



12MP Camera + Ultra High Resolution Lens
= Resolution is Clear to the Corner

Combination of Advanced Coating Technology and Use of Diverse Types of Lenses

Tamron's proprietary coating technology is employed to enhance the lens light transmittance, and combinations of diverse types of lens elements are optimized to bring the resolution to the maximum height. An aspherical lens is deployed on a wide-angle model for the first time in Tamron's machine vision lenses.



Uncompromised Image Quality at Close Distances

High image-fidelity is maintained at frequently-used close distances.

Enhanced Functionality and Utility

Well-tuned rotation torque of both focus and iris control rings facilities smooth adjustments of focusing and aperture. For ease of installation, the rings are also equipped with a lock mechanism, similar to Tamron's other current machine vision fixed-focal lens models; the rings can be locked at a choice of three lock screw positions (two positions for the Model: M111FM08).

Designed for Rugged Lens Appearance

Metal barrels are adopted for durability and vibration-resiliency, giving a rugged appearance to the lenses.



Model			M111FM08	M111FM16	M111FM25	M111FM50
Imager Size			1.1			
Mount			C			
Focal Length			8mm	16mm	25mm	50mm
Aperture Range			F/1.8 - 22			
Field of View Angle (Horizontal x Vertical)	1.1	(1:1)	76.0°x76.0°	42.6°x42.6°	27.6°x27.6°	14.1°x14.1°
		(4:3)	83.5°x66.7°	47.7°x36.5°	31.1°x23.6°	15.9°x11.9°
	1	(1:1)	71.2°x71.2°	39.4°x39.4°	25.5°x25.5°	12.9°x12.9°
		(4:3)	78.4°x62.2°	44.2°x33.7°	28.7°x21.7°	14.6°x11.0°
	2/3		57.8°x44.9°	31.0°x23.4°	20.0°x15.0°	10.1°x7.6°
TV Distortion			Less than –1.9%	Less than –0.7%	Less than –0.7%	Less than –0.3%
Focus Range			0.3m - ∞			0.4m - ∞
Operation	Focus		Manual w/Lock			
	Iris		Manual w/Lock			
Filter Size			M77 P=0.75mm	M55 P=0.75mm		M49 P=0.75mm
Weight			490g	385g	415g	415g
Operating Temperature			–20°C - +60°C			

1/1.2", 2/3" Ultra-High-Performance Machine Vision Fixed-Focal Lenses (ø29mm)

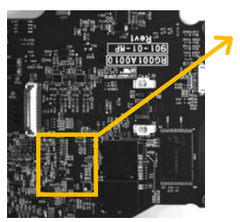
Compatible with MP camera: 1/1.2" cameras, 2/3" cameras
5.86µm pixel pitch: 1/1.2" cameras
3.45µm pixel pitch: 2/3" cameras, 1/1.8" cameras

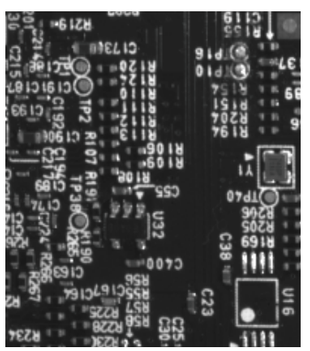
5.86µm

Industry-Leading High Contrast and Resolution at Compact Size

Compatible with both 5.86µm pixel-pitch 1/1.2" imagers and 3.45µm pixel-pitch 2/3" imagers. Equivalent resolution of full 5-mega-pixels. Industry-leading resolution and contrast in ø29mm machine-vision lenses. First-class performance in all different focal lengths of the models.

1/1.2"Camera
Shot at the Corner

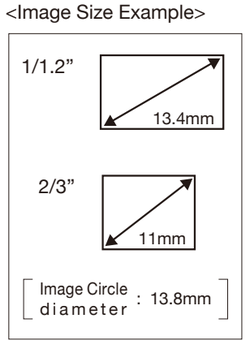




5.86µm-Pixel-Pitch
Sensor (16mm Lens)

2.4MP Camera + High Resolution Lens
=Resolution is Clear to the Corner

<Image Size Example>



High-Quality Imaging at Close-Shooting Distances

Lenses assure high-quality imaging at close-shooting distances often used.

Functionality and Utility

Rotational torque is increased to improve maneuverability for focusing and iris adjustment. Lock-screw positions are now selectable from four locations, assisting easier installation for users.



Model			M112FM08	M112FM12	M112FM16	M112FM25	M112FM35	M112FM50	M112FM75
Imager Size			1/1.2						
Mount			C						
Focal Length			8mm	12mm	16mm	25mm	35mm	50mm	75mm
Aperture Range			F/2.4 - 16	F/2.0 - 16		F/1.8 - 16	F/2.1 - 16	F/2.8 - 16	F/3.5 - 16
Field of View Angle (Horizontal x Vertical)	1/1.2	(4:3)	70.3°x54.9°	49.2°x37.6°	37.4°x28.4°	24.1°x18.2°	17.3°x13.1°	12.2°x9.2°	8.1°x6.1°
		(16:9)	75.3°x45.6°	53.2°x30.6°	40.5°x22.3°	26.2°x15.0°	18.8°x10.7°	13.2°x7.5°	8.9°x5.0°
	2/3	(4:3)	59.5°x45.8°	40.9°x31.1°	31.0°x23.4°	19.9°x15.0°	14.3°x10.7°	10.0°x7.5°	6.7°x5.0°
		(16:9)	64.0°x37.8°	44.4°x25.5°	33.7°x19.2°	21.7°x12.3°	15.5°x8.8°	10.9°x6.16°	7.3°x4.1°
TV Distortion			Less than –1.47%	Less than –0.97%	Less than –0.56%	Less than –0.09%	Less than 0.05%	Less than 0.08%	Less than 0.03%
Focus Range			0.1m - ∞				0.2m - ∞	0.3m - ∞	0.7m - ∞
Operation	Focus		Manual w/Lock						
	Iris		Manual w/Lock						
Filter Size			M35.5 P=0.5mm	M27 P=0.5mm					
Weight			86g	64g	51g	54g	57g	70g	81g
Operating Temperature			–20°C - +60°C						

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2/3” Ultra-High-Resolution Fixed-Focal Lens Series

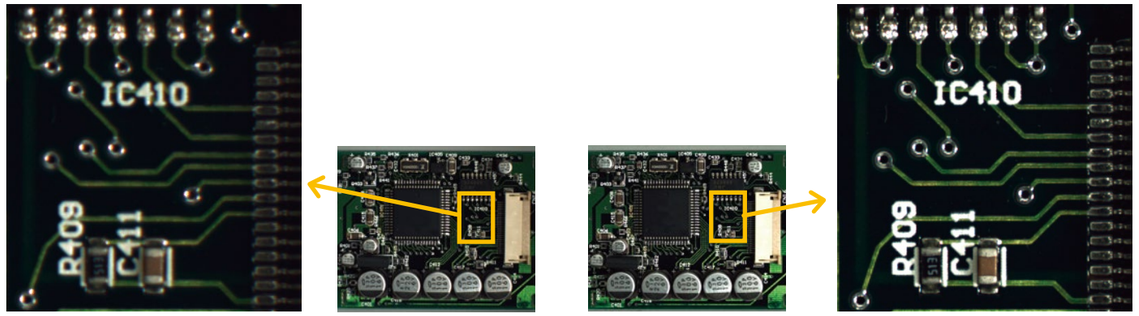
Compatible with MP camera | 2.5µm pixel pitch

2/3" cameras | 1/1.8" cameras | 1/2" cameras | 1/3" cameras

2.5µm

2.5µm-Pixel-Pitch Sensor

By supporting a 2.5µm-pixel-pitch, the lens maintains high-resolution from center to periphery. This lens series offers superior optical performance with resolution in the mega-pixel range even at the periphery of the image, and can be used for various applications such as inspection of small compornents, and inspection of detailed particles. In addition, each lens in the series provides high-quality images with minimized distortion.



5MP Camera + SD Lens
= Not Enough Resolution

SD (50mm Lens)

2.5µm-Pixel-Pitch Sensor
(50mm Lens)

5MP Camera + Ultra-High-Resolution Lens
= Resolution is Clear to the Corner

Shortened MOD

The Minimum Object Distance(MOD) is 10cm for f=6, 8, 12, 16, 25mm and 15cm for f=35 and 50mm lens. Thanks to the reduced minimum focus distance, troublesome use of extension rings can be reduced. Even with high-resolution 2.5µm-pixel-pitch sensor size, the lens pitch sensor size, the lens provides close-up ability.

Detailed Focus Adjustment

Newly designed mechanics enable a larger rotation angle for the focus making detailed focus adjustments that are necessary for higher resolution easy.



Model		M23FM06	M23FM08	M23FM12	M23FM16	M23FM25	M23FM35	M23FM50
Imager Size		2/3						
Mount		C						
Focal Length		6mm	8mm	12mm	16mm	25mm	35mm	50mm
Aperture Range		F/1.8 - 22						F/2.8 - 32
Field of View Angle (Horizontal x Vertical)	2/3	74.3°x58.4°	58.5°x45.1°	40.5°x30.9°	30.1°x22.8°	20.0°x15.1°	14.4°x10.8°	10.1°x7.6°
	1/2	56.8°x43.6°	43.8°x33.3°	30.0°x22.7°	22.1°x16.6°	14.6°x11.0°	10.5°x7.8°	7.3°x5.5°
	1/3	43.6°x33.1°	33.3°x25.2°	22.7°x17.1°	16.6°x12.5°	11.0°x8.2°	7.8°x5.9°	5.5°x4.1°
TV Distortion		Less than –2.1%	Less than –1.5%	Less than –0.4%	Less than –0.2%	Less than –0.14%	Less than –0.09%	Less than –0.03%
Focus Range		0.1m - ∞					0.15m - ∞	
Operation	Focus	Manual w/Lock						
	Iris	Manual w/Lock						
Filter Size		M67 P=0.75mm	M52 P=0.75mm	M49 P=0.75mm				
Back Focus (in Air)		12.03mm	14.13mm	16.68mm	13.49mm	14.10mm	14.49mm	13.68mm
Weight		240g	280g	333g	358g	380g	388g	374g
Operating Temperature		–10°C - +70°C						

2/3" Mega-Pixel Machine Vision Lens Series

Compatible with MP camera | 4.0µm pixel pitch

2/3" cameras | 1/1.8" cameras | 1/2" cameras | 1/3" cameras

4.0µm

- Perfectly suited for use with high-end cameras with resolution in the mega-pixel range.
- Excellent not only in the close-focus range, but also throughout the entire focal length.
- Three lock screw positions are provided for ease of set up and effective space utilization. (Iris)
- All lenses in the series use the same filter diameter. (ø30.5 mm)



Model		23FM16SP	23FM25SP	23FM50SP
Imager Size		2/3		
Mount		C		
Focal Length		16mm	25mm	50mm
Aperture Range		F/1.4 - 22		F/2.8 - 32
Field of View Angle (Horizontal x Vertical)	2/3	30.9°x23.4°	20.0°x15.1°	10.1°x7.6°
	1/2	22.7°x17.1°	14.6°x11.0°	7.3°x5.5°
	1/3	17.1°x12.9°	11.0°x8.2°	5.5°x4.1°
TV Distortion		Less than –0.1%	Less than –0.05%	Less than –0.01%
Focus Range		0.15m - ∞		0.2m - ∞
Operation	Focus	Manual w/Lock		
	Iris	Manual w/Lock		
Filter Size		M30.5 P=0.5mm		
Back Focus (in Air)		11.54mm	17.17mm	34.46mm
Weight		80g	103g	117g
Operating Temperature		–10°C - +60°C		

1/1.8" Mega-Pixel Machine Vision Lens Series

Compatible with MP camera | 4.0µm pixel pitch

1/1.8" cameras | 1/2" cameras | 1/3" cameras

4.0µm

- Compact design, yet achieves mega-pixel performance.
- No more need for a close up ring, minimum focus distance has been minimized to useful distance. This not only improves the durability of imaging systems, but also helps to reduce overall costs.
- The core structural elements— the lens barrel and the lens fixing mechanism — have been strengthened, and vibration resistance has been enhanced.
- Three lock screw positions are provided for ease of set up and effective space utilization. (Both Iris and Focus)
- All lenses in the series use the same filter diameter. (ø25.5 mm)



Model		M118FM06	M118FM08	M118FM12	M118FM16	M118FM25	M118FM50
Imager Size		1/1.8					
Mount		C					
Focal Length		6mm	8mm	12mm	16mm	25mm	50mm
Aperture Range		F/1.4 - 16				F/1.6 - 16	F/2.8 - 22
Field of View Angle (Horizontal x Vertical)	1/1.8	66.1°x50.8°	50.8°x38.6°	34.2°x25.8°	25.9°x19.5°	16.6°x12.5°	8.3°x6.2°
	1/2	58.9°x44.9°	45.0°x34.0°	30.2°x22.7°	22.8°x17.1°	14.6°x11.0°	7.3°x5.5°
	1/3	44.9°x34.0°	34.0°x25.6°	22.7°x17.1°	17.1°x12.9°	11.0°x8.2°	5.5°x4.1°
TV Distortion		Less than –3.0%	Less than –2.0%	Less than –1.2%	Less than –0.7%	Less than –0.2%	Less than –0.1%
Focus Range		0.1m - ∞					0.2m - ∞
Operation	Focus	Manual w/Lock					
	Iris	Manual w/Lock					
Filter Size		M34 P=0.5mm	M25.5 P=0.5mm				
Back Focus (in Air)		11.98mm	11.726mm	12.40mm	12.17mm	12.92mm	20.10mm
Weight		86g	44g	57g	39g	39g	52g
Operating Temperature		–10°C - +60°C					

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Fixed-Focal Machine Vision Lens Series

2/3" High-Resolution Machine Vision Lens Series

*For cameras with resolution in the mega-pixel range. Please use following lens series: 1.1", 1/1.2", 2/3", 1/1.8" Mega-Pixel Machine Vision/FA Lens Series.



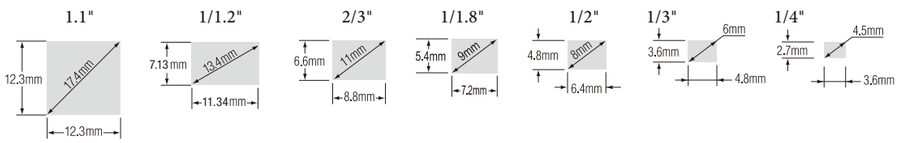
Model		22HA	219HB	25HA/HB *Type HB comes with Focus/Iris Lock.	17HD/HF *Type HF comes with Focus/Iris Lock.	20HA/HC *Type HC comes with Focus/Iris Lock.	35HB	21HA/HC *Type HC comes with Focus/Iris Lock.	1A1HB
Imager Size		2/3							
Mount		C							
Focal Length		6.5mm	8mm	12mm	16mm	25mm	35mm	50mm	75mm
Aperture Range		F/1.8 - Close	F/1.4 - 16	F/1.8 - 16	F/1.4 - 16	F/1.6 - 16	F/2.1 - 22	F/2.8 - 22	F/3.9 - 32
Field of View Angle (Horizontal x Vertical)	2/3	71.6°x55.5°	59.3°x45.2°	40.9°x30.9°	30.9°x23.2°	20.0°x15.0°	14.3°x10.8°	10.0°x7.5°	6.9°x5.2°
	1/2	53.9°x41.0°	43.6°x33.1°	30.0°x22.4°	22.5°x16.9°	14.6°x11.0°	10.4°x7.8°	7.3°x5.5°	5.0°x3.5°
	1/3	41.0°x31.0°	33.1°x25.0°	22.4°x16.6°	16.9°x12.7°	11.0°x8.2°	7.8°x5.9°	5.5°x4.1°	3.5°x2.5°
TV Distortion		Less than –2.16%	Less than –3.0%	Less than –1.6%	Less than –1.5%	Less than –0.5%	Less than +0.5%	Less than +0.5%	Less than +0.1%
Focus Range		1.5m - ∞	0.26m - ∞		0.29m - ∞	0.21m - ∞	0.3m - ∞	0.44m - ∞	0.5m - ∞
Operation	Focus	-	Manual w/Lock	Manual			Manual w/Lock	Manual	Manual w/Lock
	Iris	Manual w/Lock		Manual			Manual w/Lock	Manual	Manual w/Lock
Filter Size		M35.5 P=0.5mm	M25.5 P=0.5mm						
Back Focus (in Air)		13.00mm	11.60mm	11.03mm	11.85mm	11.60mm	15.53mm	22.10mm	27.12mm
Weight		60g	40g	40g	50g	37g	44g	50g	68g
Operating Temperature		–5°C - +50°C	–10°C - +45°C		–5°C - +45°C	–10°C - +45°C	–10°C - +60°C	–10°C - +45°C	–10°C - +70°C

Special Accessories for Machine Vision Lenses

Extension Ring	MR-SET	7 Sets (0.5mm, 1mm, 2mm, 5mm, 10mm, 20mm, 40mm)			
Filter for Protection	25.5-NO	Ø25.5mm	Polarizer Filter	25.5-PL	Ø25.5mm
	30.5-NO	Ø30.5mm		30.5-PL	Ø30.5mm
	35.5-NO	Ø35.5mm		35.5-PL	Ø35.5mm

Remarks

Imager Size



1.1" lenses can also be used with 1.1", 1", 1/1.2", 2/3", 1/1.8", 1/2", 1/2.5", 1/2.7", 1/2.8", 1/3" & 1/4" Imager cameras.
1/1.2" lenses can also be used with 2/3", 1/1.8", 1/2", 1/2.5", 1/2.7", 1/2.8", 1/3" & 1/4" Imager cameras.
2/3" lenses can also be used with 1/1.8", 1/2", 1/2.5", 1/2.7", 1/2.8", 1/3" & 1/4" Imager cameras.
1/1.8" lenses can also be used with 1/2", 1/2.5", 1/2.7", 1/2.8", 1/3" & 1/4" Imager cameras.
1/2" lenses can also be used with 1/2.5", 1/2.7", 1/2.8", 1/3" & 1/4" Imager cameras.
1/3" lenses can also be used with 1/4" Imager cameras.

When you fit C-Mount lenses with CS-Mount cameras, please use the C-CS adapter.

The “Field of View Angle” in the data sheets shows the data when the lens is used with a camera with the indicated imager size.
When other cameras with different imager sizes are used, please refer to the following datum:

1.1" Lens	1/1.2" Camera	0.77× against the Specified Angle of View
	2/3" Camera	0.63× against the Specified Angle of View
	1/2" Camera	0.46× against the Specified Angle of View
	1/3" Camera	0.34× against the Specified Angle of View
	1/4" Camera	0.26× against the Specified Angle of View
1/1.2" Lens	2/3" Camera	0.82× against the Specified Angle of View
	1/2" Camera	0.6× against the Specified Angle of View
	1/3" Camera	0.45× against the Specified Angle of View
	1/4" Camera	0.34× against the Specified Angle of View

2/3" Lens	1/2" Camera	0.73× against the Specified Angle of View
	1/3" Camera	0.55× against the Specified Angle of View
	1/4" Camera	0.41× against the Specified Angle of View
1/1.8" Lens	1/2" Camera	0.89× against the Specified Angle of View
	1/3" Camera	0.67× against the Specified Angle of View
	1/4" Camera	0.5× against the Specified Angle of View
1/2" Lens	1/3" Camera	0.75× against the Specified Angle of View
	1/4" Camera	0.56× against the Specified Angle of View
1/3" Lens	1/4" Camera	0.75× against the Specified Angle of View

1/1.2", 2/3" Ultra-High-Performance Machine Vision Fixed-Focal Lenses (ø29mm)



5.86µm pixel pitch

IMX174	1/1.2" 2-Mega
IMX249	1/1.2" 2-Mega

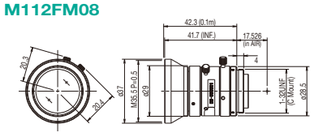
3.45µm pixel pitch

IMX250	2/3" 5-Mega
IMX264	2/3" 5-Mega

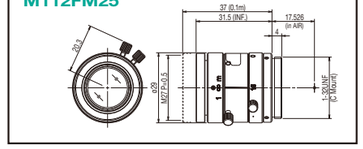
DIMENSIONS

1/1.2" 5.86µm pixel pitch 2/3" 3.45µm pixel pitch

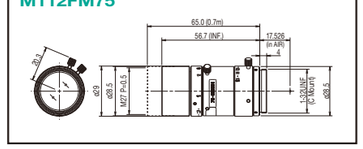
M112FM08



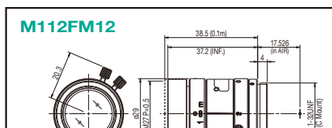
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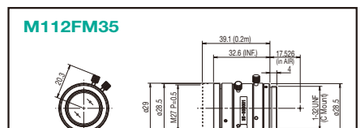
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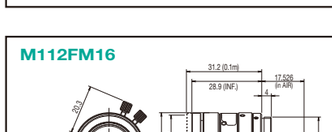
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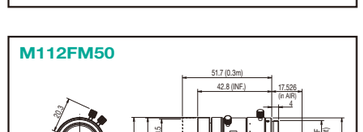
M112FM35



M112FM16



M112FM50



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