

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

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

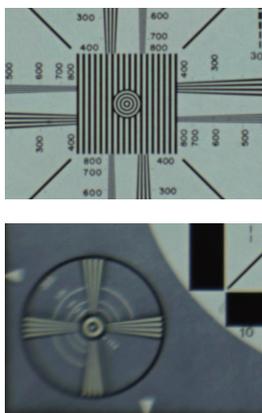
1.1" Ultra-High-Performance Machine Vision Fixed-Focal Lenses

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

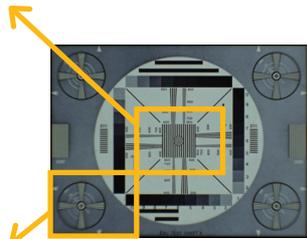
3.1 μm

Industry-Leading High Contrast and Resolution

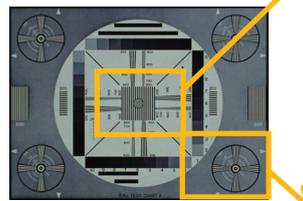
The lenses, optimized for 3.1-μm-pixel-pitch images, equivalent to 1.1" 12 mega-pixels. Use of state-of-the-art optical technology enables high-contrast and high-resolution from the corner to the periphery of images despite the large aperture size. Tamron's machine vision fixed-focal lens line-up also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



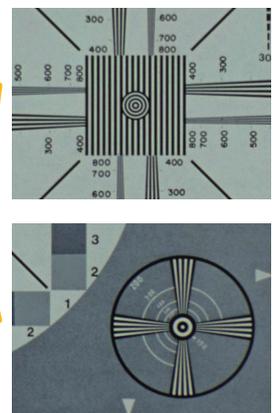
5MP Camera + SD Lens
= Not Enough Resolution



SD (50mm Lens)



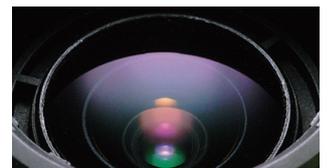
3.1 μm-Pixel-Pitch Sensor
(50mm Lens)



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 distance.

Enhanced Functionality and Utility

Well-tuned rotation torque of both focus and iris control rings facilitates 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 - ∞					
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					

Machine Vision

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

Compatible with MP camera

2.5μm pixel pitch

2.5μm

2/3" cameras

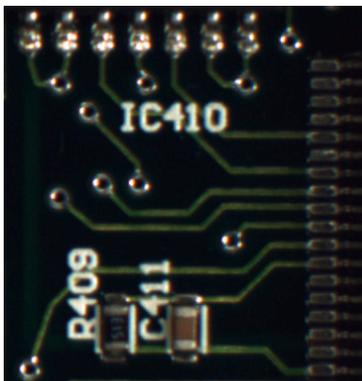
1/1.8" cameras

1/2" cameras

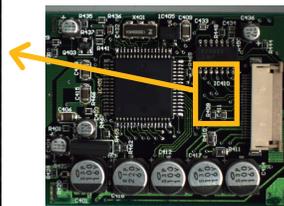
1/3" cameras

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 in the periphery of the image, and can be used for various applications such as inspection of small component, and inspection of detailed particles. In addition, each lens in the series provides high-quality images with minimized distortion.



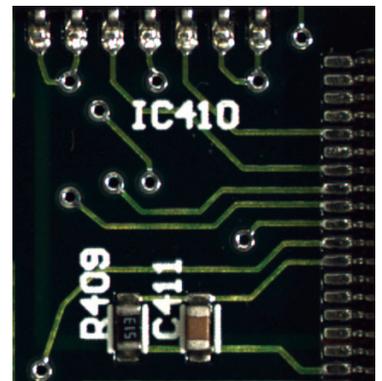
5MP Camera + SD Lens
= Not Enough Resolution



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 ring can be reduced. Even with high-resolution 2.5μm-pixel-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						
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						

Machine Vision

2/3" Mega-Pixel Machine Vision Lens Series

Compatible with MP camera

4µm 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)



23FM16SP

23FM25SP

23FM50SP

Model				
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

4µm pixel pitch

1/1.8" cameras

1/2" cameras

1/3" cameras

4.0µm

- Compact design, yet achieving 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)



M118FM06

M118FM08

M118FM12

M118FM16

M118FM25

M118FM50

Model							
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						

Lens Series

2/3" High-Resolution Machine Vision Lens Series

*For cameras with resolution in the mega-pixel range, please use lenses in either of the following series:
2/3" Mega-Pixel Machine Vision / FA Lens Series or 1/1.8" Mega-Pixel Machine Vision / FA Lens Series.



22HA



219HA/HB



25HA/HB



17HD/HF



20HA/HC



35HB



21HA/HC



1A1HB

Model	22HA	219HA/HB	25HA/HB	17HD/HF	20HA/HC	35HB	21HA/HC	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	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
	30.5-NO	Ø30.5mm
	35.5-NO	Ø35.5mm
Polarizer Filter	25.5-PL	Ø25.5mm
	30.5-PL	Ø30.5mm
	35.5-PL	Ø35.5mm

Remarks

Imager Size	1.1"	2/3"	1/1.8"	1/2"	1/3"	1/4"

- 1.1" lenses can also be used with 1", 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.

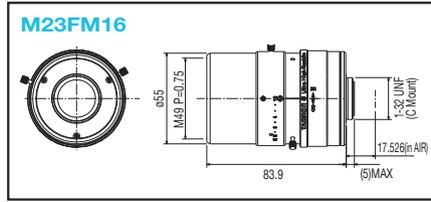
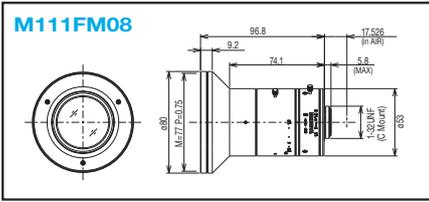
- When you fit C-Mount lenses with CS-Mount cameras, please use the C-CS adapter.

- The "Field of View Angel" 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:

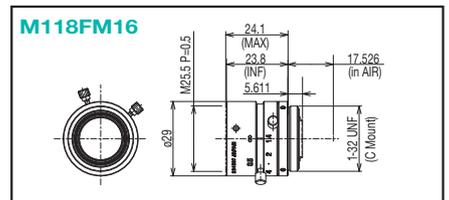
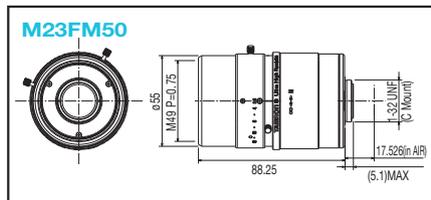
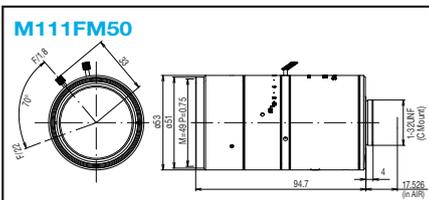
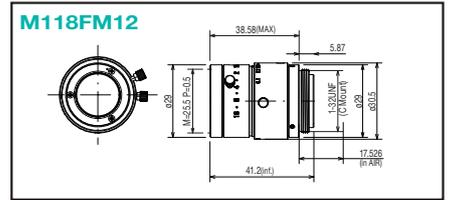
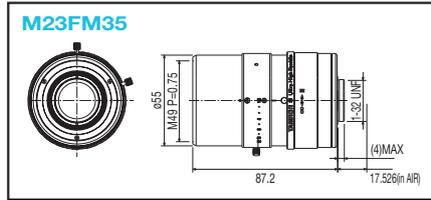
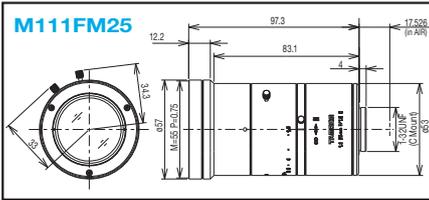
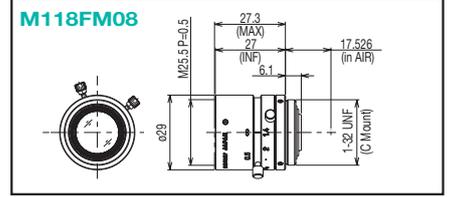
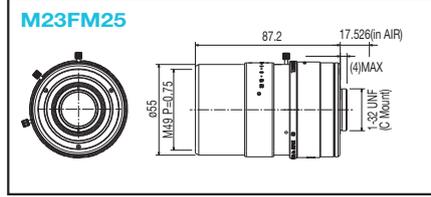
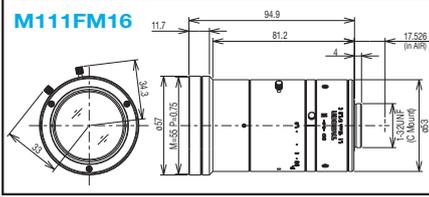
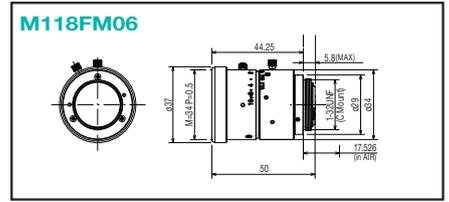
1.1" Lens	2/3" Camera	0.63× against the Specified Angle of View
	1/2" Camera	0.46× against the Specified Angle of View
	1/3" Camera	0.34× against the Specified Angle of View
	1/4" Camera	0.26× against the Specified Angle of View
2/3" Lens	1/2" Camera	0.73× against the Specified Angle of View
	1/3" Camera	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	0.88× against the Specified Angle of View
	1/3" Camera	0.66× 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

DIMENSIONS

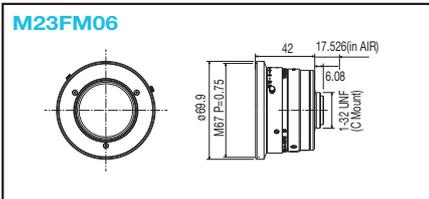
1.1" 3.1µm pixel pitch



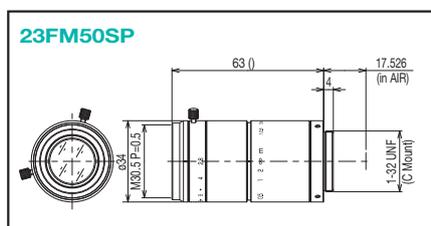
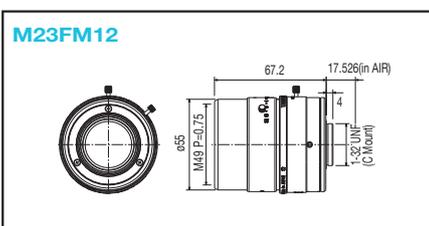
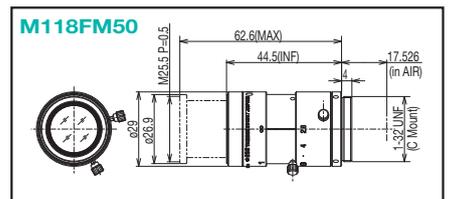
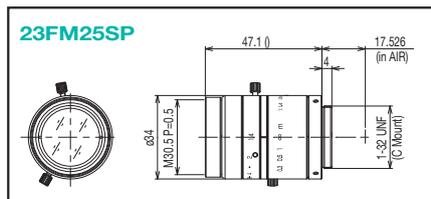
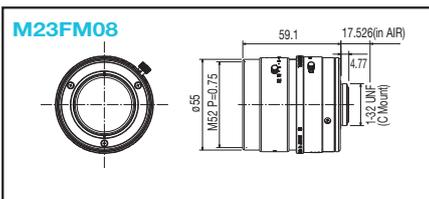
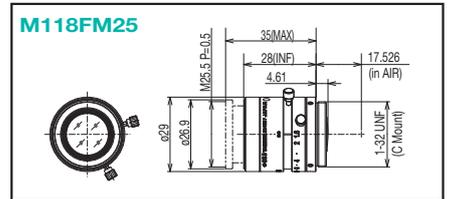
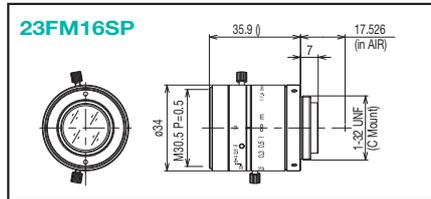
1/1.8" 4.0µm pixel pitch



2/3" 2.5µm pixel pitch



2/3" 4.0µm pixel pitch



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 improvement at all levels and facets of its business operations.



•Specifications subject to change without notice 2015.9

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