

# CF50HA-1

## Technical Datasheet

1"

**FUJINON**  
FUJIFILM



## Fujinon CF-HA Series

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Fujifilm's Fujinon CF-HA series lenses offer a 7.4 $\mu$ m resolving power (equivalent to 1.5 megapixels) and are designed for use with 1" and smaller sensors. The CF-HA series is available in 6 variants from 12.5 mm to 75 mm and offer low distortion thanks to Fujinon's aspherical lens design

### Specification Highlights

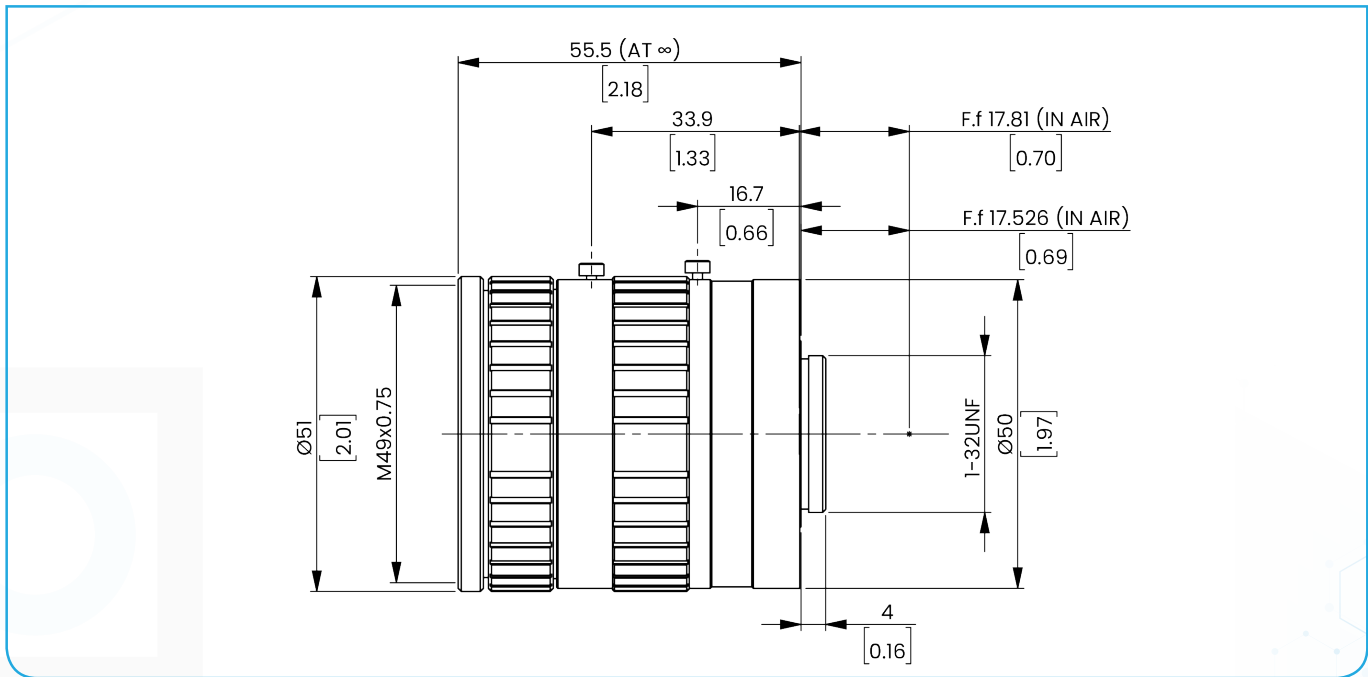
**FOCAL LENGTH:** 50 mm  
**FORMAT:** 1"  
**PIXEL SIZE:** 7.4  $\mu$ m  
**LENS MOUNT:** C-Mount  
**APERTURE:** F1.8-F22

**WORKING DISTANCE:** 400 mm - Infinity  
**FILTER THREAD:** M49 x 0.75  
**WEIGHT:** 235 grams  
**RESOLUTION MP:** 1.5 MP  
**LENS CLASS:** Fixed Focal Length

## Full Specifications

Focal Length	50 mm	Flange Back	17.526 mm
Focal Length Design Value	51.72 mm	Entrance Pupil Position (From Mount)	Not Specified
Iris Range (f-number)	F1.8-F22	Exit Pupil Position (From Image Plane)	-50.47 mm
Angle of View	14.1° x 10.6° (2/3°)	Front Principal Point (From Mount)	-1.87 mm
Working Distance (From Front of Lens Barrel)	400 mm - Infinity	Rear Principal Point (From Mount)	-34.19 mm
Operation of Focus	Manual	Distance Between Principal Points	-32.32 mm
Operation of Iris	Manual	TV Distortion	0.2%
Filter Thread	M49 x 0.75	Dimensions	φ51 × 55.5
Mount	C-Mount	Chief Ray Angle	Not Specified
Weight	235 Grams	Relative Illumination (Aperture F4.0; Image Height at Diagonal)	Not Listed
Sensor Size (Standard)	1" (7.4 μm)	Relative Illumination (Aperture at Full Open; Image Height at Diagonal)	62%
Back Focal Length (In Air)	17.81 mm	Operation Temperature	-10°C - +50°C

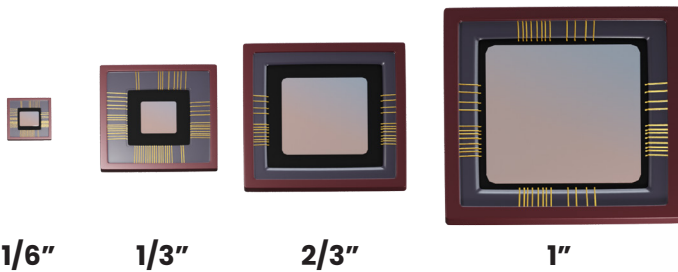
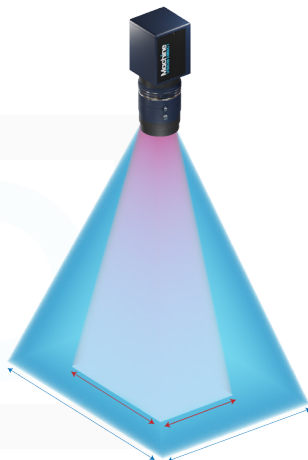
## Dimensions



**CF50HA-1 REFERENCE FOV CHART**

Working Distance (mm)	Optical Magnification	Extension Ring (mm)	Field of View (mm)									
			1"		1/1.2"		2/3"		1/1.8"		1/2"	
			H	V	H	V	H	V	H	V	H	V
1500	0.034x	-	371.4	278.7	311.2	233.4	255.5	191.6	206.7	155.1	185.8	139.4
1450	0.036x	-	359.1	269.4	300.8	225.7	247.0	185.3	199.9	149.9	179.7	134.8
1400	0.037x	-	346.8	260.2	290.5	217.9	238.5	178.9	193.0	144.7	173.5	130.1
1350	0.038x	-	334.4	250.9	280.1	210.1	230.0	172.5	186.1	139.6	167.3	125.5
1300	0.040x	-	322.1	241.6	269.8	202.4	221.5	166.1	179.2	134.4	161.1	120.8
1250	0.041x	-	309.7	232.4	259.5	194.6	213.0	159.8	172.3	129.3	154.9	116.2
1200	0.043x	-	297.4	223.1	249.1	186.8	204.5	153.4	165.5	124.1	148.7	111.6
1150	0.045x	-	285.1	213.8	238.8	179.1	196.0	147.0	158.6	118.9	142.6	106.9
1100	0.047x	-	272.7	204.6	228.4	171.3	187.5	140.6	151.7	113.8	136.4	102.3
1050	0.049x	-	260.4	195.3	218.1	163.6	179.0	134.3	144.8	108.6	130.2	97.6
1000	0.052x	-	248.0	186.0	207.7	155.8	170.5	127.9	138.0	103.5	124.0	93.0
950	0.054x	-	235.7	176.8	197.4	148.0	162.0	121.5	131.1	98.3	117.8	88.4
900	0.057x	-	223.4	167.5	187.0	140.3	153.5	115.1	124.2	93.1	111.6	83.7
850	0.061x	-	211.0	158.2	176.7	132.5	145.0	108.7	117.3	88.0	105.5	79.1
800	0.064x	-	198.7	148.9	166.3	124.7	136.5	102.4	110.4	82.8	99.3	74.4
750	0.069x	-	186.3	139.7	156.0	117.0	128.0	96.0	103.6	77.7	93.1	69.8
700	0.074x	-	174.0	130.4	145.6	109.2	119.5	89.6	96.7	72.5	86.9	65.2
650	0.079x	-	161.6	121.1	135.3	101.4	111.0	83.2	89.8	67.3	80.7	60.5
600	0.086x	-	149.3	111.9	124.9	93.7	102.5	76.9	82.9	62.2	74.5	55.9
550	0.094x	-	136.9	102.6	114.6	85.9	94.0	70.5	76.0	57.0	68.3	51.2
500	0.103x	-	124.6	93.3	104.2	78.1	85.5	64.1	69.2	51.9	62.2	46.6
450	0.114x	-	112.2	84.0	93.9	70.3	77.0	57.7	62.3	46.7	56.0	42.0
400	0.129x	-	99.9	74.8	83.5	62.6	68.5	51.3	55.4	41.5	49.8	37.3
350	0.147x	1	87.5	65.5	73.2	54.8	60.0	45.0	48.5	36.4	43.6	32.7
300	0.171x	5	75.1	56.2	62.8	47.0	51.5	38.6	41.6	31.2	37.4	28.0
250	0.205x	5	62.7	46.9	52.4	39.3	43.0	32.2	34.7	26.0	31.2	23.4
200	0.256x	10	50.3	37.6	42.1	31.5	34.5	25.8	27.9	20.9	25.0	18.8
150	0.340x	15	37.9	28.3	31.7	23.7	25.9	19.4	21.0	15.7	18.8	14.1
100	0.507x	20	25.4	19.0	21.3	15.9	17.4	13.0	14.1	10.5	12.6	9.5

FOV Charts are intended to be used as general guidance and are not guaranteed to be accurate as all sensors do not have the same dimensions, including sensors with the same format size. For the most accurate approximations, please use a lens calculator that accounts for your specific sensor dimensions



**Sensor Formats**

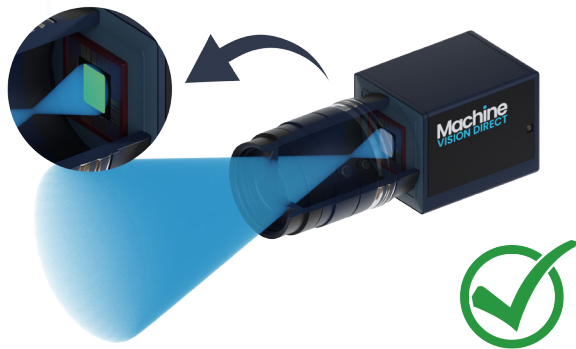
It is important to make sure you size your lens to the correct sensor size (format). The image you get from a 2/3" format lens will provide a smaller field of view when used with a 1/3" format sensor than it will provide when used with a 2/3" format sensor, even with the same working distance

## Sensor Size Compatibility Chart

Model	Compatible format sizes								Focal length (mm)
	4/3	1.1	1	1/1.2	2/3	1/1.8	1/2	1/3	
<u>CF12.5HA-1</u>	-	-	•	•	•	•	•	•	12.5
<u>CF16HA-1</u>	-	-	•	•	•	•	•	•	16
<u>CF25HA-1</u>	-	-	•	•	•	•	•	•	25
<u>CF35HA-1</u>	-	-	•	•	•	•	•	•	35
<u>CF50HA-1</u>	-	-	•	•	•	•	•	•	50
<u>CF75HA-1</u>	-	-	•	•	•	•	•	•	75

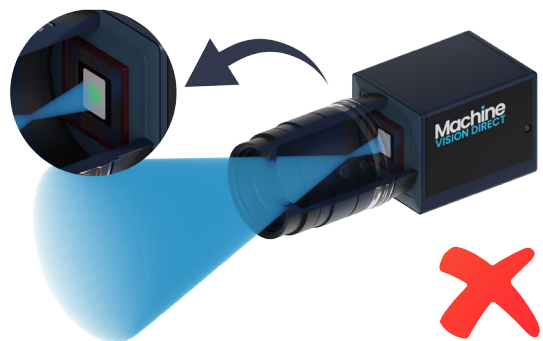
- Compatible sensor size (std.): Ideal size to maximize the target resolution.

Please note that not all sizes of sensors are listed on this chart. It is generally okay to use larger format lenses with smaller format sensors, but not the other way around



### Properly Sized Lens Format

A camera with a properly sized lens will project an image that will cover the whole sensor



### Undersized Lens Format

A camera with an undersized lens format will project an image that will not cover the whole sensor. This will cause vignetting of the image

## CF-HA SERIES LENSES



### CF12.5HA-1

**FOCAL LENGTH:** 12.5 mm  
**APERTURE:** F1.4-F22  
**WORKING DISTANCE:** 100 mm - Infinity  
**FORMAT:** 1"  
**FILTER THREAD:** M49 x 0.75

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### CF16HA-1

**FOCAL LENGTH:** 16 mm  
**APERTURE:** F1.4-F22  
**WORKING DISTANCE:** 100 mm - Infinity  
**FORMAT:** 1"  
**FILTER THREAD:** M49 x 0.75

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### CF25HA-1

**FOCAL LENGTH:** 25 mm  
**APERTURE:** F1.4-F22  
**WORKING DISTANCE:** 100 mm - Infinity  
**FORMAT:** 1"  
**FILTER THREAD:** M49 x 0.75

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### CF35HA-1

**FOCAL LENGTH:** 35 mm  
**APERTURE:** F1.4-F22  
**WORKING DISTANCE:** 200 mm - Infinity  
**FORMAT:** 1"  
**FILTER THREAD:** M49 x 0.75

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### CF50HA-1

**FOCAL LENGTH:** 50 mm  
**APERTURE:** F1.8-F22  
**WORKING DISTANCE:** 400 mm - Infinity  
**FORMAT:** 1"  
**FILTER THREAD:** M49 x 0.75

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### CF75HA-1

**FOCAL LENGTH:** 75 mm  
**APERTURE:** F1.8-F22  
**WORKING DISTANCE:** 900 mm - Infinity  
**FORMAT:** 1"  
**FILTER THREAD:** M49 x 0.75

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## FUJINON LENS SERIES



### HF-HA-1S

**FOCAL LENGTH:** 6 mm, 9 mm, 12.5 mm  
 16 mm, 25 mm, 35 mm  
 50 mm, 75 mm

**PIXEL SIZE:** 6.2  $\mu\text{m}$

**FORMAT:** 2/3"

**RESOLUTION:** 1.5 MP

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### HF-SA

**FOCAL LENGTH:** 12.5 mm, 16 mm, 25 mm  
 35 mm, 50 mm, 75 mm

**PIXEL SIZE:** 3.45  $\mu\text{m}$

**FORMAT:** 2/3"

**RESOLUTION:** 5 MP

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### HF-XA-5M

**FOCAL LENGTH:** 6 mm, 8 mm, 12 mm  
 16 mm, 25 mm  
 35 mm, 50 mm

**PIXEL SIZE:** 3.45  $\mu\text{m}$

**FORMAT:** 2/3"

**RESOLUTION:** 5 MP

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### HF-XA-1F

**FOCAL LENGTH:** 8 mm, 12 mm, 16 mm  
 25 mm, 35 mm

**PIXEL SIZE:** 3.45  $\mu\text{m}$

**FORMAT:** 2/3"

**RESOLUTION:** 5 MP

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### HF-12M

**FOCAL LENGTH:** 8 mm, 12 mm, 16 mm  
 25 mm, 35 mm

**PIXEL SIZE:** 2.1  $\mu\text{m}$

**FORMAT:** 2/3"

**RESOLUTION:** 12 MP

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### CF-ZA-1S

**FOCAL LENGTH:** 8 mm, 12 mm, 16 mm  
 25 mm, 35 mm, 50 mm

**PIXEL SIZE:** 2.74  $\mu\text{m}$

**FORMAT:** 1.1"

**RESOLUTION:** 23 MP

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### CF-HA

**FOCAL LENGTH:** 12.5 mm, 16 mm, 25 mm  
 35 mm, 50 mm, 75 mm

**PIXEL SIZE:** 7.4  $\mu\text{m}$

**FORMAT:** 1"

**RESOLUTION:** 1.5 MP

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### FE185

**FOCAL LENGTH:** 6 mm, 9 mm, 12.5 mm  
 16 mm, 25 mm, 35 mm  
 50 mm, 75 mm

**PIXEL SIZE:** 6.2  $\mu\text{m}$

**FORMAT:** 2/3"

**RESOLUTION:** 1.5 MP

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Revision 6/11/2023