

for

FA & Machine Vision

5 Mega-Pixel Lens

(Manual Iris Lens, compatible with 5 mega-pixel cameras)

Mega-Pixel Lens

(Manual Iris Lens, compatible with mega-pixel cameras)

Manual Iris Lens

Manual Zoom Lens

Line-Scan Lens

UV Lens

Accessory

Corporate Profile

Since its entry to the CCTV lens market in 1961, PENTAX has produced lenses with a focus on quality, performance and durability for manufacturers and customers around the world.

Our continuous product development has enabled us to maintain a high level of trust and customer satisfaction throughout the past and into the future

The most important quality factor of a lens is its ability to capture clear images through a combination of resolving power and contrast. PENTAX CCTV lenses, including high magnification Image Processing lenses for use with megapixel cameras for developing FA systems are designed and built using modern technologies and precision manufacturing techniques, thus producing images with superb contrast trusted by clients from all over the industry.

Advanced PENTAX performance continues to win global renown by solving the needs of the times.

PENTAX Technology for helping people.

Keeping an eye on people in the society of the future.

History

- 1961 Cosmicar CCTV Lenses are distributed worldwide for the first time
- 1967 COSMICAR brand name for the CCTV fixed-focus lens adopted
- 1975 The industry's first video signal auto iris lens introduced
- 1981 The industry's first variable photometric auto iris lens introduced
- 1982 EX series – the world's smallest auto iris lens introduced
FX series – the industry's first CS mount lens introduced
- 1985 ER series – the industry's first remote-controllable auto iris lens introduced
- 1990 HS6ZME – the world's smallest CCTV motorized zoom lens introduced
- 1991 LX series – the industry's first 1/3" auto iris lens introduced
- 1993 PENTAX branding first used
- 1994 ISO9001 certification obtained
- 1995 1/3" CS mount Varifocal lens introduced
- 1997 The industry's first 1/4" integrated Varifocal lens series introduced
ISO14001 certification obtained
- 1998 The industry's first 1/4" CS mount lens series introduced
- 2001 TS2V314BED – the industry's first 1/3" CS mount Day/Night Varifocal lens introduced
Line Scan Lens series introduced
M series – the industry's first Megapixel Machine Vision lenses introduced
- 2002 H55ZME – the world's longest focal length 55X zoom lens introduced
- 2003 H2520-UVM – the industry's first megapixel UV lens introduced
- 2005 QD3ZMED – the industry's first pan-focus zoom lens introduced
- 2009 TS3VP213ED – M – the industry's first Varifocal plus lens introduced
Winner of the "Best in OEM" category at ISC West 2009 in the USA
5M series – the ultra high-definition 5 megapixel lens series introduced
- 2010 H55ZAME-F-PR01 incorporating PAIR (PENTAX Atmospheric Interference Reduction)
technology introduced
Wins the "Best in Video Device" category at ISC West 2010 in the USA
- 2011 Introduces H55ZAME-F-PR02
Wins the "Best in Public Safety Solutions" category at ISC West 2011 in the USA
- Oct 2011 Foundation of PENTAX RICOH IMAGING COMPANY, LTD. as a member of the Ricoh Group

Contents

5 Mega-Pixel Lens P3
(Manual Iris Lens, compatible with 5 mega-pixel cameras)

Mega-Pixel Lens P5
(Manual Iris Lens, compatible with mega-pixel cameras)

Manual Iris Lens P7

Manual Zoom Lens P10

Line-Scan Lens P11

UV Lens P13

Accessory P15

Optical data and other specifications P17
Explanation of terms P19
Angle of view table P22
Identification table P23

5 Mega-Pixel Lens

(Manual Iris Lens, compatible with 5 mega-pixel cameras)

Features

- Ultra-high-performance lens for close-up applications, compatible with 5 mega-pixel cameras (2/3" format)
 - 140 lp/mm resolution from the center to the periphery of the lens.
 - Ultra-high resolution lens compatible with sensor resolutions of up to 3.45 μ m pixel pitch
 - Transmits sharp, high-contrast images from the center to the periphery
- Minimal optical distortion
 - Every lens in the series transmits images with minimal optical distortion.
- Bright lens with only minimal peripheral light reduction
 - Compact, external diameter of only 43mm, with fast F1.4 aperture.
 - The design of the C814-5M keeps vignetting to an absolute minimum. Although wide angle, C814-5M has 70% light transmission in the corners (2/3" format) with the iris fully open. This is a 'bright' lens in the true sense of the word!
- An ideal component for any compact high-performance machine vision system
 - State of the art design, manufacturing, and quality control techniques produce high quality lenses with no image tilt, and minimal individual difference.
 - Lenses work beautifully in multi-camera inspection systems and 3D imaging systems.
 - The focus and iris rings incorporate a new scale and font for improved visibility and operation during adjustment.

Applications

Ultra-high-resolution, high contrast images from the center to the periphery can be used to detect defects on objects such as PC Boards and wafers. Optimised for pattern recognition, gauging, and other precision tasks.

Amount of peripheral light captured by the C1614-5M

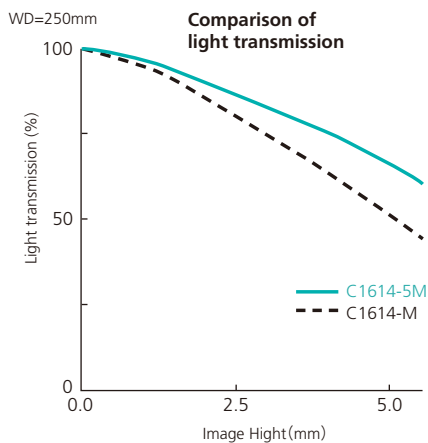


Designed for increased peripheral light transmission; compatible with 5 mega-pixel cameras.

Amount of peripheral light captured by the C1614-M



A slight decrease in peripheral light transmission compared to the adjacent mega pixel lens.

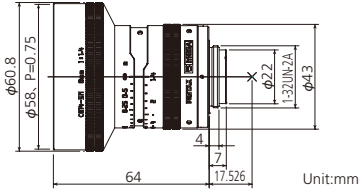


The lens keeps peripheral light reduction to an absolute minimum capturing bright, high-resolution images.



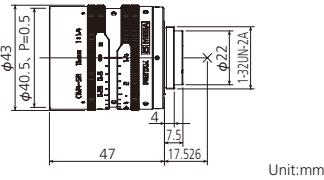
C1614-5M

C814-5M



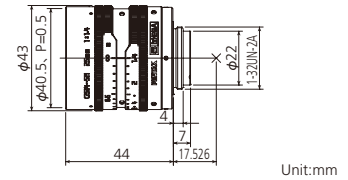
Format Size	2/3" format
Focal Length	8.0mm
Max. Aperture Ratio	1:1.4
Iris Range	1.4~16
Mount	C
Horizontal Angle of View	1/4" format 24.8°
	1/3" format 32.9°
	1/2" format 43.2°
	2/3" format 57.8°
Min. Object Distance	0.1m
Back Focal Length	11.5mm
Filter size	58 P=0.75mm
Dimensions	φ60.8x64mm
Weight	260g
Remarks	Focus & Iris Lock Screws

C1614-5M



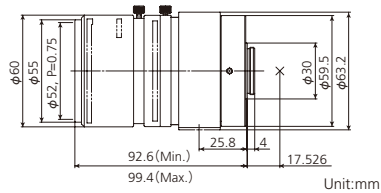
Format Size	2/3" format
Focal Length	16.0mm
Max. Aperture Ratio	1:1.4
Iris Range	1.4~16
Mount	C
Horizontal Angle of View	1/4" format 12.9°
	1/3" format 17.1°
	1/2" format 22.7°
	2/3" format 30.8°
Min. Object Distance	0.1m
Back Focal Length	11.5mm
Filter size	40.5 P=0.5mm
Dimensions	φ43x47mm
Weight	140g
Remarks	Focus & Iris Lock Screws

C2514-5M



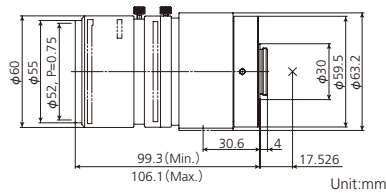
Format Size	2/3" format
Focal Length	25.0mm
Max. Aperture Ratio	1:1.4
Iris Range	1.4~16
Mount	C
Horizontal Angle of View	1/4" format 8.2°
	1/3" format 11.0°
	1/2" format 14.6°
	2/3" format 19.9°
Min. Object Distance	0.1m
Back Focal Length	12.3mm
Filter size	40.5 P=0.5mm
Dimensions	φ43x44mm
Weight	130g
Remarks	Focus & Iris Lock Screws

C5028A-M02



Format Size	2/3" format
Focal Length	50mm
Max. Aperture Ratio	1:2.8
Iris Range	2.8~22
Mount	C
Min.-Max. Magnification	0.15~0.23X
Horizontal Field of View	1/4" format 24~16mm
	1/3" format 32~21mm
	1/2" format 43~28mm
	2/3" format 59~38mm
Working Distance	361~242mm
Back Focal Length	30.43~34.54mm
Filter size	52 P=0.75mm
Dimensions	φ63.2x92.6mm
Weight	560g
Remarks	Focus & Iris Lock Screws. 5 mega pixel (2/3" format) / 4 mega pixel (1.1" format)

C5028A-M035



Format Size	2/3" format
Focal Length	50mm
Max. Aperture Ratio	1:2.8
Iris Range	2.8~22
Mount	C
Min.-Max. Magnification	0.28~0.4X
Horizontal Field of View	1/4" format 13~9mm
	1/3" format 17~12mm
	1/2" format 23~16mm
	2/3" format 31~22mm
Working Distance	201~146mm
Back Focal Length	37.16~43.29mm
Filter size	52 P=0.75mm
Dimensions	φ63.2x99.3mm
Weight	580g
Remarks	Focus & Iris Lock Screws. 5 mega pixel (2/3" format) / 4 mega pixel (1.1" format)

Mega-Pixel Lens

(Manual Iris Lens, compatible with mega-pixel cameras)

Features

- Ultra-high performance lens for close-up objects, compatible with 2 mega-pixel cameras
- High resolution lens compatible with CCD and CMOS sensor resolutions of up to 4~5 μ m pixel pitch.
Transmits sharp, high-contrast images from the center to the periphery
- Compact and lightweight; ideal for integration into machine vision systems
- Lockable focus & iris rings

Applications

Defect detection of printed circuit boards, wafers etc.

Mega-Pixel Lens (Manual Iris Lens, compatible with mega-pixel cameras)



Mega-Pixel lens



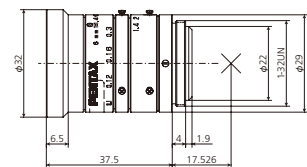
Standard VGA lens

* Both lenses mounted on a mega-pixel camera and compared.



C1614-M

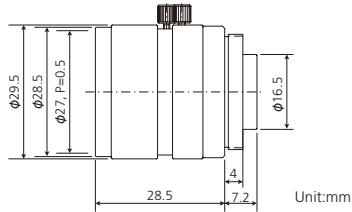
H614-MQ



Unit:mm

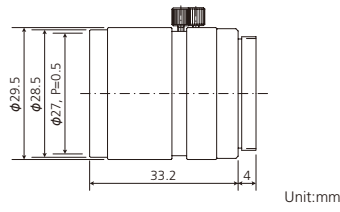
Format Size	1/2" format	
Focal Length	6.0mm	
Max. Aperture Ratio	1:1.4	
Iris Range	1.4~16	
Mount	C	
Horizontal Angle of View	1/4" format	32.3°
	1/3" format	44.5°
	1/2" format	57.4°
	2/3" format	—
Min. Object Distance	0.1m	
Back Focal Length	12.32mm	
Filter size	—	
Dimensions	ϕ 32x37.5mm	
Weight	58g	
Remarks	Focus & Iris Lock Screws	

H1214-M



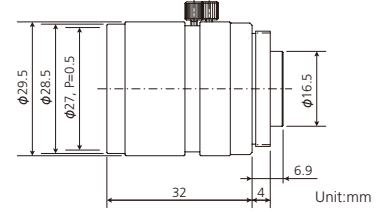
Format Size	1/2" format
Focal Length	12.0mm
Max. Aperture Ratio	1:1.4
Iris Range	1.4~16
Mount	C
Horizontal Angle of View	1/4" format 16.5° 1/3" format 21.9° 1/2" format 28.9° 2/3" format —
Min. Object Distance	0.25m
Back Focal Length	11.50mm
Filter size	27 P=0.5mm
Dimensions	φ29.5×28.5mm
Weight	55g
Remarks	Focus & Iris Lock Screws

C1614-M



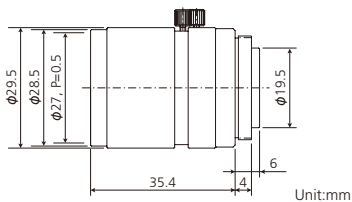
Format Size	2/3" format
Focal Length	16.0mm
Max. Aperture Ratio	1:1.4
Iris Range	1.4~16
Mount	C
Horizontal Angle of View	1/4" format 12.9° 1/3" format 17.1° 1/2" format 22.7° 2/3" format 31.0°
Min. Object Distance	0.25m
Back Focal Length	14.61mm
Filter size	27 P=0.5mm
Dimensions	φ29.5×33.2mm
Weight	63g
Remarks	Focus & Iris Lock Screws

C2514-M



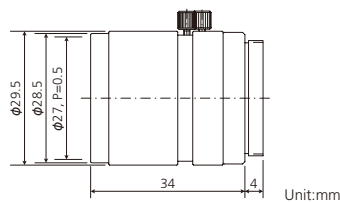
Format Size	2/3" format
Focal Length	25.0mm
Max. Aperture Ratio	1:1.4
Iris Range	1.4~16
Mount	C
Horizontal Angle of View	1/4" format 8.2° 1/3" format 11.0° 1/2" format 14.6° 2/3" format 20.0°
Min. Object Distance	0.25m
Back Focal Length	11.50mm
Filter size	27 P=0.5mm
Dimensions	φ29.5×32mm
Weight	55g
Remarks	Focus & Iris Lock Screws

C3516-M



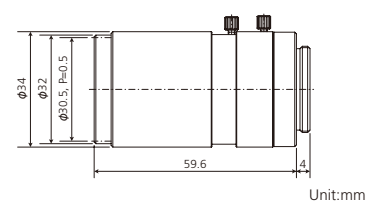
Format Size	2/3" format
Focal Length	35.0mm
Max. Aperture Ratio	1:1.6
Iris Range	1.6~16
Mount	C
Horizontal Angle of View	1/4" format 6.1° 1/3" format 8.1° 1/2" format 10.8° 2/3" format 14.8°
Min. Object Distance	0.4m
Back Focal Length	11.85mm
Filter size	27 P=0.5mm
Dimensions	φ29.5×35.4mm
Weight	64g
Remarks	Focus & Iris Lock Screws

C5028-M



Format Size	2/3" format
Focal Length	50.0mm
Max. Aperture Ratio	1:2.8
Iris Range	2.8~22
Mount	C
Horizontal Angle of View	1/4" format 4.1° 1/3" format 5.5° 1/2" format 7.3° 2/3" format 10.0°
Min. Object Distance	0.9m
Back Focal Length	21.03mm
Filter size	27 P=0.5mm
Dimensions	φ29.5×34mm
Weight	55g
Remarks	Focus & Iris Lock Screws

C7528-M



Format Size	2/3" format
Focal Length	75.0mm
Max. Aperture Ratio	1:2.8
Iris Range	2.8~32
Mount	C
Horizontal Angle of View	1/4" format 2.8° 1/3" format 3.8° 1/2" format 5.0° 2/3" format 6.9°
Min. Object Distance	0.7m
Back Focal Length	30.94mm
Filter size	30.5 P=0.5mm
Dimensions	φ34×59.6mm
Weight	125g
Remarks	Focus & Iris Lock Screws

Manual Iris Lens

Features

- Standard machine vision lens series
- Optical performance optimized for compatibility with VGA ~ XGA cameras
- Lineup compatible with 1/2" ~ 1" format CCD and CMOS cameras
- Lockable focus & iris rings

Applications

Pattern recognition, component positioning on PC Boards; inspection of pharmaceutical/medical devices, food/beverage inspection

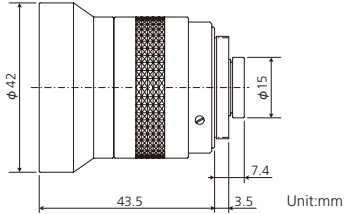


Popularly used in various factories as the standard machine vision lens.



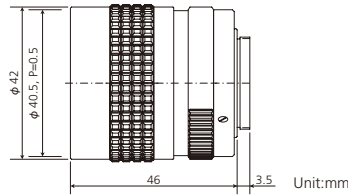
B2514D

H416



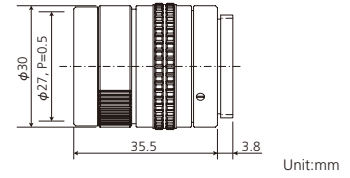
Format Size	1/2" format
Focal Length	4.2mm
Max. Aperture Ratio	1:1.6
Iris Range	1.6~Close
Mount	C
Horizontal Angle of View	1/4" format 47.9°
	1/3" format 64.3°
	1/2" format 86.8°
	2/3" format —
Min. Object Distance	0.2m
Back Focal Length	10.42mm
Filter size	—
Dimensions	φ42×43.5mm
Weight	120g
Remarks	Iris Lock Screws, Fixed Focus

H612A



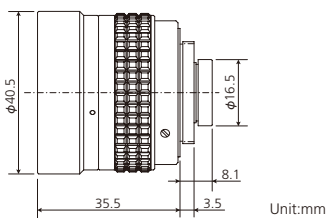
Format Size	1/2" format
Focal Length	6.0mm
Max. Aperture Ratio	1:1.2
Iris Range	1.2~Close
Mount	C
Horizontal Angle of View	1/4" format 33.0°
	1/3" format 43.5°
	1/2" format 56.9°
	2/3" format —
Min. Object Distance	0.2m
Back Focal Length	14.31mm
Filter size	40.5 P=0.5mm
Dimensions	φ42×46mm
Weight	125g
Remarks	Focus & Iris Lock Screws

H1212B



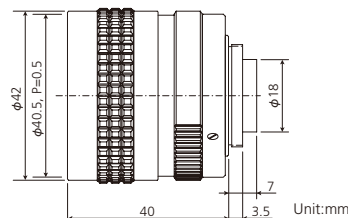
Format Size	1/2" format
Focal Length	12.0mm
Max. Aperture Ratio	1:1.2
Iris Range	1.2~22
Mount	C
Horizontal Angle of View	1/4" format 16.9°
	1/3" format 22.6°
	1/2" format 30.2°
	2/3" format —
Min. Object Distance	0.2m
Back Focal Length	13.87mm
Filter size	27 P=0.5mm
Dimensions	φ30×35.5mm
Weight	67g
Remarks	Focus & Iris Lock Screws

C418DX



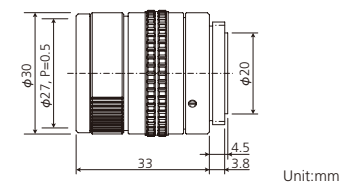
Format Size	2/3" format
Focal Length	4.8mm
Max. Aperture Ratio	1:1.8
Iris Range	1.8~Close
Mount	C
Horizontal Angle of View	1/4" format 41.7°
	1/3" format 55.1°
	1/2" format 72.4°
	2/3" format 96.4°
Min. Object Distance	0.3m
Back Focal Length	9.71mm
Filter size	—
Dimensions	φ40.5×35.5mm
Weight	105g
Remarks	Iris Lock Screws, Fixed Focus

C815B



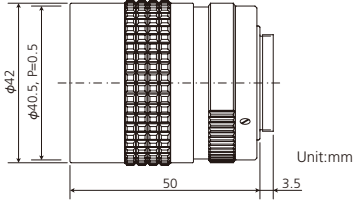
Format Size	2/3" format
Focal Length	8.5mm
Max. Aperture Ratio	1:1.5
Iris Range	1.5~Close
Mount	C
Horizontal Angle of View	1/4" format 24.0°
	1/3" format 31.9°
	1/2" format 42.1°
	2/3" format 56.5°
Min. Object Distance	0.2m
Back Focal Length	10.88mm
Filter size	40.5 P=0.5mm
Dimensions	φ42×40mm
Weight	120g
Remarks	Focus & Iris Lock Screws

C1614A



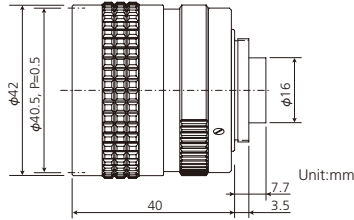
Format Size	2/3" format
Focal Length	16.0mm
Max. Aperture Ratio	1:1.4
Iris Range	1.4~22
Mount	C
Horizontal Angle of View	1/4" format 12.7°
	1/3" format 16.9°
	1/2" format 22.5°
	2/3" format 30.7°
Min. Object Distance	0.3m
Back Focal Length	13.22mm
Filter size	27 P=0.5mm
Dimensions	φ30×33mm
Weight	58g
Remarks	Focus & Iris Lock Screws

B1214D-2



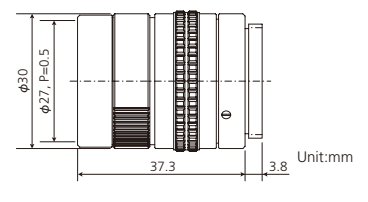
Format Size	1" format
Focal Length	12.5mm
Max. Aperture Ratio	1:1.4
Iris Range	1.4~Close
Mount	C
Horizontal Angle of View	1/4" format 16.1° 1/3" format 21.4° 1/2" format 28.4° 2/3" format 38.5° 1" format 53.7°
Min. Object Distance	0.3m
Back Focal Length	14.40mm
Filter size	40.5 P=0.5mm
Dimensions	φ42×50mm
Weight	135g
Remarks	Focus & Iris Lock Screws

B1218A



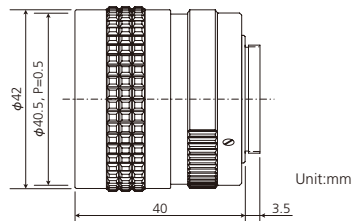
Format Size	1" format
Focal Length	12.5mm
Max. Aperture Ratio	1:1.8
Iris Range	1.8~Close
Mount	C
Horizontal Angle of View	1/4" format 16.5° 1/3" format 22.0° 1/2" format 29.1° 2/3" format 39.6° 1" format 55.5°
Min. Object Distance	0.3m
Back Focal Length	10.36mm
Filter size	40.5 P=0.5mm
Dimensions	φ42×40mm
Weight	95g
Remarks	Focus & Iris Lock Screws

B2514D



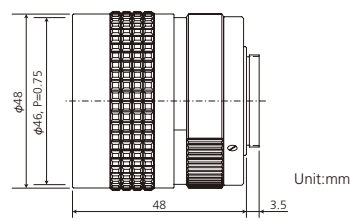
Format Size	1" format
Focal Length	25.0mm
Max. Aperture Ratio	1:1.4
Iris Range	1.4~22
Mount	C
Horizontal Angle of View	1/4" format 8.2° 1/3" format 11.0° 1/2" format 14.6° 2/3" format 20.1° 1" format 29.0°
Min. Object Distance	0.3m
Back Focal Length	14.98mm
Filter size	27 P=0.5mm
Dimensions	φ30×37.3mm
Weight	76g
Remarks	Focus & Iris Lock Screws

B2518



Format Size	1" format
Focal Length	25.0mm
Max. Aperture Ratio	1:1.8
Iris Range	1.8~Close
Mount	C
Horizontal Angle of View	1/4" format 8.2° 1/3" format 11.0° 1/2" format 14.6° 2/3" format 19.9° 1" format 28.2°
Min. Object Distance	0.6m
Back Focal Length	15.80mm
Filter size	40.5 P=0.5mm
Dimensions	φ42×40mm
Weight	87g
Remarks	Focus & Iris Lock Screws

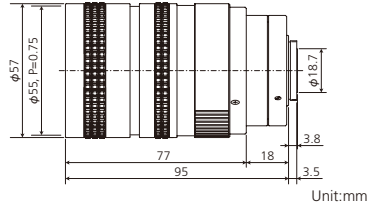
B5014A



Format Size	1" format
Focal Length	50.0mm
Max. Aperture Ratio	1:1.4
Iris Range	1.4~Close
Mount	C
Horizontal Angle of View	1/4" format 4.1° 1/3" format 5.5° 1/2" format 7.3° 2/3" format 10.0° 1" format 14.4°
Min. Object Distance	1.0m
Back Focal Length	18.05mm
Filter size	46 P=0.75mm
Dimensions	φ48×48mm
Weight	180g
Remarks	Focus & Iris Lock Screws

Manual Zoom Lens

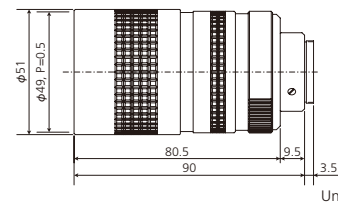
H6Z810



Unit:mm

Format Size	1/2" format
Focal Length	8~48mm
Max. Aperture Ratio	1:1.0~1.2
Iris Range	1.0~22
Mount	C
Horizontal Angle of View	1/4" format 24.9~4.4°
	1/3" format 33.0~5.8°
	1/2" format 43.3~7.7°
	2/3" format —
Min. Object Distance	0.75m
Back Focal Length	13.65mm
Filter size	55 P=0.75mm
Dimensions	φ57×95mm
Weight	430g
Remarks	Manual Iris, Lock Screws

C6Z1218



Unit:mm

Format Size	2/3" format
Focal Length	12.5~75mm
Max. Aperture Ratio	1:1.8
Iris Range	1.8~22
Mount	C
Horizontal Angle of View	1/4" format 16.1~2.7°
	1/3" format 21.4~3.7°
	1/2" format 28.4~4.9°
	2/3" format 38.8~6.7°
Min. Object Distance	1.0m
Back Focal Length	18.41mm
Filter size	49 P=0.75mm
Dimensions	φ51×90mm
Weight	320g
Remarks	Manual Iris

Line-Scan Lens

Features

- Ultra-High Resolution. High Contrast
- Suitable for sensors up to 45mm
- Abundant Light Distribution
- Minimal distortion
- Available in F-mount and PENTAX K mounts
- Lockable focus & iris rings

Applications

Inspection of steel, pulp, fibre/textile, film and other flat materials



YF5028A-02

YF5028A-02



Format Size	45mm Image Circle
Focal Length	50.0mm
Max. Aperture Ratio	1:2.8
Iris Range	2.8~22
Mount	F-mount(bayonet mount)
Field of View	4,096×7μm 191~125mm
	7,450×4.7μm 234~152mm
	4,096×10μm 273~178mm
Working Distance	361~242mm
Back Focal Length	30.43~34.54mm
Filter size	52 P=0.75mm
Dimensions	φ60×63.6mm
Min.-Max. Magnification	0.15~0.23X
Weight	425g
Remarks	Focus & Iris Lock Screws. Not for Photographic Cameras.

YF5028A-035



Format Size	45mm Image Circle
Focal Length	50.0mm
Max. Aperture Ratio	1:2.8
Iris Range	2.8~22
Mount	F-mount(bayonet mount)
Field of View	4,096×7μm 102~72mm
	7,450×4.7μm 125~88mm
	4,096×10μm 146~102mm
Working Distance	201~146mm
Back Focal Length	37.16~43.29mm
Filter size	52 P=0.75mm
Dimensions	φ60×70.4mm
Min.-Max. Magnification	0.28~0.4X
Weight	435g
Remarks	Focus & Iris Lock Screws. Not for Photographic Cameras.

YF3528/YK3528



Format Size	45mm Image Circle
Focal Length	35.0mm
Max. Aperture Ratio	1:2.8
Iris Range	2.8~22
Mount	F-mount(bayonet mount)YF3528 K-mount(PENTAX bayonet mount)YK3528
Field of View	4,096×7μm 57mm(Magnification: 0.5x)
	7,450×4.7μm 70mm(Magnification: 0.5x)
	4,096×10μm 81mm(Magnification: 0.5x)
Min. Object Distance	0.19m(Magnification: 0.5x)
Back Focal Length	33.22mm
Filter size	62 P=0.75mm
Dimensions	φ72×56.8mm (YF3528) φ72×57.8mm (YK3528)
Min.-Max. Magnification	∞~0.5X
Weight	380g
Remarks	Focus: Lock Screw Iris: Click Stop. Not for Photographic Cameras

YF5028/YK5028



Format Size	45mm Image Circle
Focal Length	50.0mm
Max. Aperture Ratio	1:2.8
Iris Range	2.8~22
Mount	F-mount(bayonet mount)YF5028 K-mount(PENTAX bayonet mount)YK5028
Field of View	4,096×7μm 57mm 39.9mm(Magnification: 0.5x)
	7,450×4.7μm 70mm 52.6mm(Magnification: 0.5x)
	4,096×10μm 81mm 64.5mm(Magnification: 0.5x)
Min. Object Distance	0.25m(Magnification: 0.5x)
Back Focal Length	36.99mm
Filter size	62 P=0.75mm
Dimensions	φ72×56.8mm (YF5028) φ72×57.8mm (YK5028)
Min.-Max. Magnification	∞~0.5X
Weight	370g
Remarks	Focus: Lock Screw Iris: Click Stop. Not for Photographic Cameras

UV Lens

Features

- High performance quartz glass, enabling the capture of sharp images in the near-ultraviolet region.
- Extended wavelength range (230nm to 800nm), with peak performance at 365nm.
- Compact design, ideal for integration into machine vision systems
- Optimised for use with band pass filters and UV illumination to provide falsified documents detection

Applications

Detection of counterfeit banknotes; falsified documents and credit cards, surface inspection of circuit boards for soldering defects



UV Lens with near UV light. The texture of material and unevenness of ink can be recognised

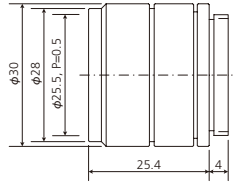


Ordinary Lens with visible light



B2528-UV

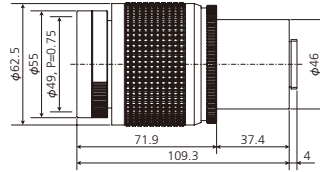
B2528-UV



Unit:mm

Format Size	1" format	
Focal Length	25.0mm	
Max. Aperture Ratio	1:2.8	
Iris Range	2.8~16	
Mount	C	
Horizontal Angle of View	1/4" format	8.3°
	1/3" format	11.1°
	1/2" format	14.8°
	2/3" format	20.4°
1" format	29.7°	
Min. Object Distance	0.23m	
Back Focal Length	22.07mm	
Filter size	25.5 P=0.5mm	
Dimensions	φ30×25.4mm	
Weight	33g	
Remarks	Optimum wavelength 365nm	

B7838-UV



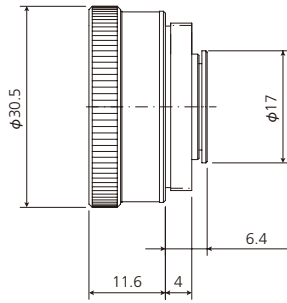
Unit:mm

Format Size	1" format	
Focal Length	78mm	
Max. Aperture Ratio	1:3.8	
Iris Range	3.8~16	
Mount	C	
Horizontal Angle of View	1/4" format	2.7°
	1/3" format	3.5°
	1/2" format	4.7°
	2/3" format	6.5°
1" format	9.5°	
Min. Object Distance	0.44m	
Back Focal Length	71.31mm	
Filter size	49 P=0.75mm	
Dimensions	φ62.5×109.3mm	
Weight	446g	
Remarks	Optimum wavelength 365nm	

Extender

Attaches to the rear of C-Mount lenses to double the focal length.

[2-EX]



Specification

	2-EX
Focal Length Magnification	2X
Flange Back Length	17.526mm
Weight	51g
Compatible Lens	C-Mount

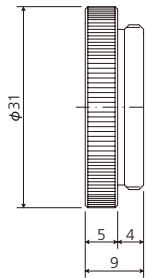
Note

- 1) When the focal length is doubled, the angle of view halves and the F no. is doubled.
- 2) Resolution is lowered, contrast reduced and image sharpness reduced due to decreased depth of field. (There is no change in zoom ratio or minimum object distance.)
- 3) Range extender cannot be attached if the rear optic protrudes by 3.7mm or more from the flange surface.

Mount Adapter

Use this mount adapter to mount a C-mount lens on a CS-mount camera.

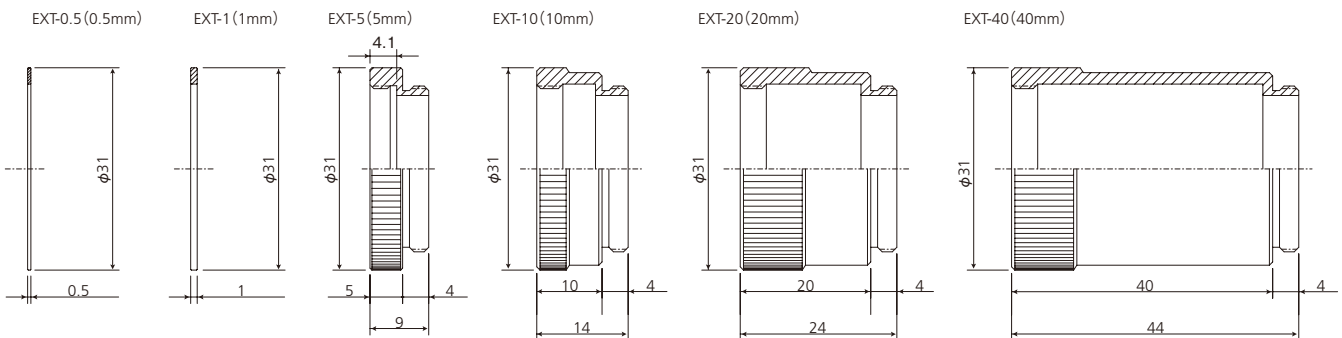
[C-CS-A]



Extension Tube Set (Macro Rings)

Extension tube set (Macro Rings) are inserted between the lens and camera to shift the focus point further than the mechanical limit of the lens, for close-up applications. Different length tubes can be used in combination with each other.

[EX-C6]



Specification

Model No.	EXT-0.5	EXT-1	EXT-5	EXT-10	EXT-20	EXT-40
Length (mm)	0.5	1	5	10	20	40
Max. Diameter	31mm					

Note

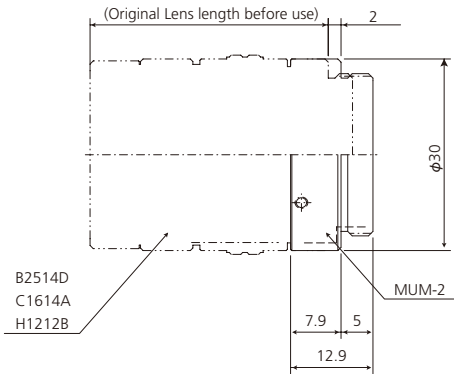
Extension Tubes are not suitable for zoom lenses. Lens will not track focus whilst zooming.

The greater the length of the Extension Tube, the closer the focus. Please refer to information on Close-up applications on page 18.

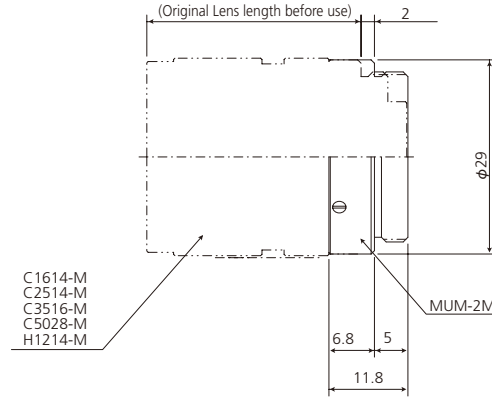
Macro Focus Mount

Macro Focus Mounts extend the flange back length by 2mm by replacing the original C-Mount of lens.

[MUM-2 (for B2514D, C1614A, H1212B)]



[MUM-2M (for Mega-Pixel Lens only)]



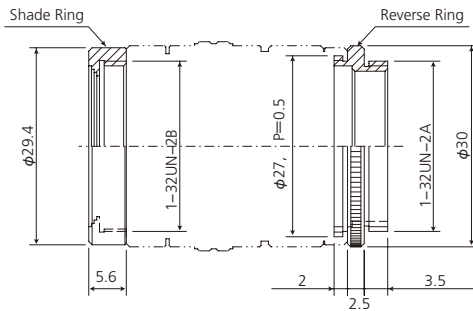
* Mount screw length is normally 3.5~4mm.

If the use of 2mm of Extension Tube is required, the remaining mount screw is insufficient to mount to the camera securely. Under these circumstances use of this accessory is highly recommended.

Reverse Ring

To achieve magnification greater than 1:1, use this accessory to reverse the lens. Set comprises of a reverse ring and a shade ring.

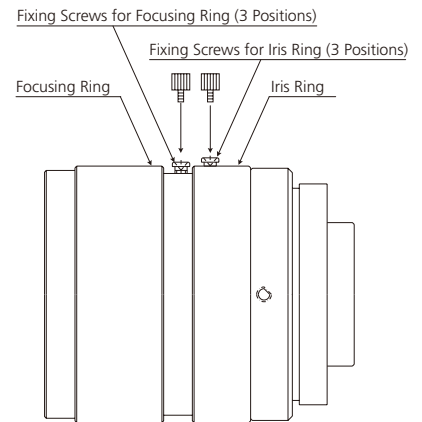
[RR-27]



Lock Levers and Lock Screws

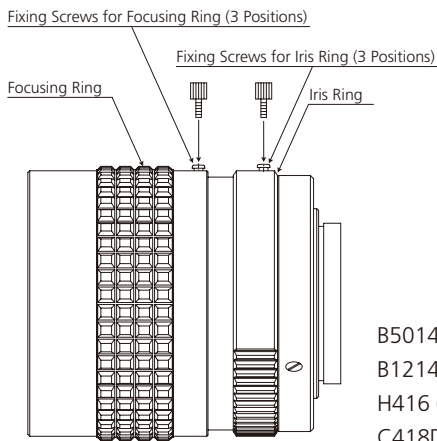
	Iris	Focus	Accessories	Mount Position
5 Mega-Pixel Lens				
C814-5M	M1.4x2.2	M1.4x2.5	Thumb Screws (x2)	Adjustable
C1614-5M				
C2514-5M				
C5028A-M02				
C5028A-M035	Thumb Screw(x1)	Thumb Screw(x1)	M2.5x6.0(x2)	
2 Mega-Pixel Lens				
H614-MQ	M1.7x3.0	M1.7x3.0	Thumb Screws(x2)	-
H1214-M	M1.4x2.2	M1.4x3.0	Thumb Screws (x2)	Adjustable
C1614-M				
C2514-M				
C3516-M				
C5028-M	M2.0x2.8	M2.0xM5.0		
C7528-M				
Manual Iris Lens (1/2" format)				
H416	M1.4x3.5	-	Thumb Screws(x1)	Adjustable
H612A	M1.4x2.8	M1.4x1.4	Thumb Screws(x2)	
H1212B	M1.4x2.8	M1.4x2.0		
Manual Iris Lens (2/3" format)				
C418DX	M1.4x3.5	-	Thumb Screws(x1)	Adjustable
C815B	M1.4x2.8	M1.4x1.4	Thumb Screws(x2)	
C1614A	M1.4x2.8	M1.4x2.0		
Manual Iris Lens (1" format)				
B1214D-2	M1.4x3.5	M1.4x1.4		
B1218A				
B2514D	M1.4x2.8	M1.4x2.0	Thumb Screws (x2)	Adjustable
B2518	M1.4x3.5	M1.4x1.4		
B5014A	M1.4x4.0	M1.4x1.6		
Line Scan Lens				
YF/YK5028A-02	Thumb Screw(x1)	Thumb Screw(x1)	M2.5x6.0(x2)	-
YF/YK5028A-035				-
YF/YK3528	Click Stop	Thumb Screw		-
YF/YK5028				-

Lens is supplied locked by 6 x Fixing Screws. Remove 6 x Fixing Screws and replace with 2 x Thumb Screws (supplied) as required.

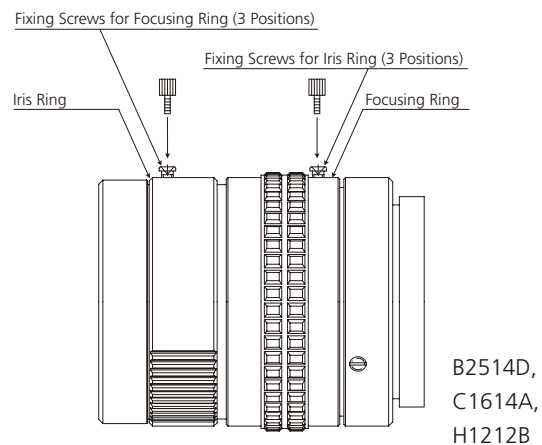


C7528-M (M2.0 Lock Screw),
C5028-M, C3516-M, C2514-M,
C1614-M, H1214-M, C814-5M,
C1614-5M, C2514-5M

Note. Do not remove (-) screws in the iris ring.
Doing so may cause the iris blades to jam.

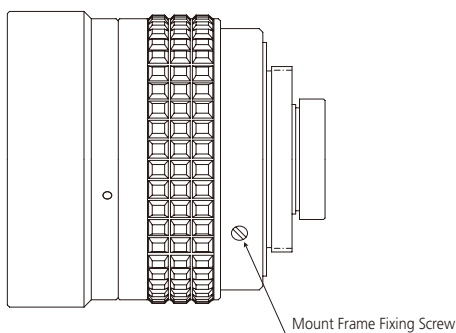


B5014A, B2518, B1218A,
B1214D-2, C815B, H612A,
H416 (Iris Ring only),
C418DX (Iris Ring only)



B2514D,
C1614A,
H1212B

Mount rotation adjustment



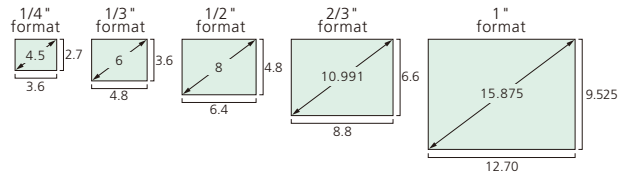
● The mount position of the lens can be adjusted to see the focus and iris scale as follows.

- 1: Loosen the mount fixing screws (3~4 pieces) on the mount
- 2: Rotate the lens in the mount to see the scale indicator.
- 3: Tighten the mount fixing screws (3~4 positions) at torque (8~12 N·cm) uniformly.

Note. Screw locking agent is not normally used for mount fixing screws.

Optical Calculations for Close-Up Applications

When viewing an object measuring 20mm per side from a working distance (WD) of 100mm with a 1/2" format camera (6.4 x 4.8mm, 1.5 mega pixels)



First, calculate the magnification, M, by the following formula.

$$M = B/A$$

$$M = 4.8/20 = -0.24x$$

(The horizontal screen dimension is automatically decided when the vertical dimension is decided. Therefore, the vertical screen dimension is used here).

Obtain a rough idea of the focal length required for your application with the object distance and magnification between the object size and image size by using the following formula:

$$f = -M \cdot O$$

$$f = -((-0.24) \times 100) = 24\text{mm}$$

According to the calculation a 24mm lens is required. Then, select one of the closest PENTAX lenses to 24mm: B2514D, B2518, C2514-M. Since the camera is 1.5 mega pixel, substitute the true focal length of C2514-M into the following formula to calculate the overall distance L, by adding up the figures indicated in the attached table.

$$L = -f/M + f + f + \Delta H - f \cdot M$$

$$L = -(25.00 / (-0.24)) + 25.00 + 25.00 + (-10.51) - (25.00 \times (-0.24))$$

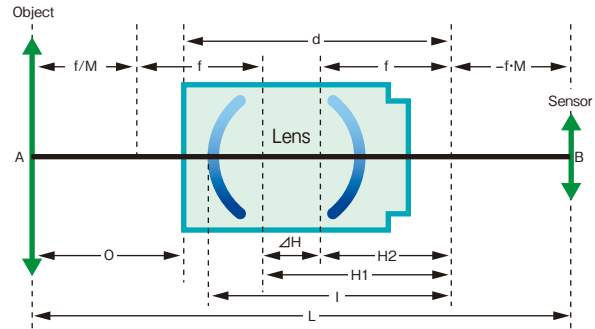
$$L = 104.17 + 25.00 + 25.00 - 10.51 + 6.00 = 149.66$$

Finally, you can get an exact objective distance, O by the following formula (f·M is the length of the extension tube.)

$$O = L - d + f \cdot M$$

$$O = 149.66 - 49.53 + (25.00 \times (-0.24)) = 94.13$$

Therefore, when viewing an object measuring 20mm per side on a 1/2" format camera, use the C2514-M and extension tube of 6mm in length with a WD of 94.13 (about 94mm). Use a lens with a longer f (focal length) if you want a longer WD, or a lens with a shorter focal length if you want a shorter WD.



A	Object Size (Vertical or Horizontal)
B	Imager Format Size (Vertical or Horizontal)
M	Magnification (B/A)
f	Focal Length
ΔH	Distance between 1st and 2nd Principal Point
H1	1st Principal Position
H2	2nd Principal Position
d	Distance between the front end of lens barrel and the focal point
L	Distance between the 1st lens element and the focal point
f·M	Length of the extension tube
O	Object Distance (Distance between the front end of lens barrel and the object)

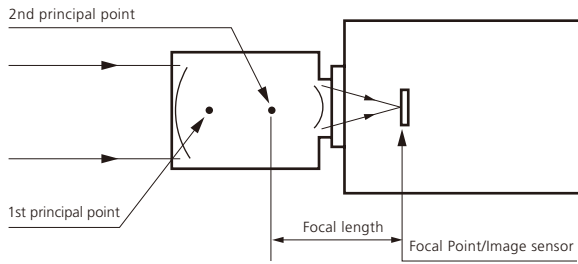
*Note: The (+) sign denotes the Object → Imager direction.

Optical Data Unit: [mm] ※ [%]

Model	Focal Length (f)	1st Principal Position (H1)	2nd Principal Position (H2)	Distance between H1 and H2 (ΔH)	Optical Path Length (l)	Total Length (d)	Entrance Pupil Position	Diameter of Entrance Pupil	Exit Pupil Position	Diameter of Exit Pupil	Distortion ※	Vignetting ※	Back Focus Length (in air)	Mechanical Focus (Adjustable focusing range by rotating focus ring)	Remarks	
5 Mega-Pixel Lens																
C814-5M	8.2	-49.9	-8.2	41.7	77.7	66.2	-57.1	6.0	-64.2	47.0	-4.9	71.5	11.5	0.6	W.D.=250mm,y=5.5	
C1614-5M	16.0	-29.6	-16.0	13.6	58.6	47.4	-40.9	11.2	-54.3	37.9	-0.5	60.1	11.5	2.3	W.D.=250mm,y=5.5	
C2514-5M	25.0	-9.8	-25.0	-15.2	47.6	35.3	-22.4	17.4	-50.2	35.0	-1.0	65.2	12.3	5.5	W.D.=250mm,y=5.5	
C5028A-M02	51.4	-80.0	-61.7	18.4	109.7	76.7	-77.2	18.1	-59.0	17.2	0	98.1	33.0	2.9	M=-0.2	
C5028A-M035	51.1	-88.1	-69.0	19.0	116.9	76.2	-85.7	18.0	-66.7	17.2	0	98.3	40.7	3.9	M=-0.35	
Mega-Pixel Lens																
H614-MQ	6.0	-35.2	-6.0	29.2	42.0	47.2	-39.5	-	-21.8	-	-4.3	54.6	12.4	-	W.D.=280mm,y=4.0	
H1214-M	12.4	-17.8	-12.4	5.4	41.0	46.0	-25.8	9.1	-34.5	25.3	-0.7	59.0	11.5	1.5	W.D.=250mm,y=4.0	
C1614-M	16.0	-18.0	-16.0	2.0	46.6	50.7	-30.2	11.3	-68.0	47.9	-2.0	43.9	14.6	1.5	W.D.=250mm,y=5.5	
C2514-M	25.0	-14.5	-25.0	-10.5	39.5	49.5	-19.6	17.6	-31.4	22.1	-1.2	48.0	11.5	3.5	W.D.=250mm,y=5.5	
C3516-M	34.0	-10.9	-34.0	-23.0	47.1	52.9	-11.3	20.8	-34.3	21.0	-0.9	61.5	11.9	3.5	W.D.=250mm,y=5.5	
C5028-M	50.0	-47.4	-50.0	-2.6	46.5	51.5	-3.2	18.2	-26.5	9.7	-0.1	79.4	21.0	3.5	W.D.=250mm,y=5.5	
C7528-M	72.8	-57.4	-72.8	-15.4	72.8	77.2	16.1	25.9	-36.2	12.9	0	96.5	30.9	10.5	W.D.=250mm,y=5.5	
Manual Iris Lens (1/2" format)																
H416	4.3	-42.0	-4.3	37.7	59.3	61.0	-45.9	2.8	-47.1	29.9	-35.8	43.0	10.4	-		
H612A	6.2	-38.9	-6.2	32.7	58.1	63.5	-44.5	5.5	-70.3	62.3	-5.8	42.0	14.3	0.3		
H1212B	12.2	-26.7	-12.2	14.5	47.6	53.0	-38.5	10.7	-322.6	282.8	-4.3	45.9	13.9	1.1		
Manual Iris Lens (2/3" format)																
C418DX	4.9	-36.9	-4.9	32.0	51.4	53.0	-41.2	2.7	-46.2	25.5	-29.7	25.9	9.8	-		
C815B	8.5	-31.2	-8.5	22.6	53.6	57.5	-39.1	5.9	-120.1	82.7	-4.2	29.2	10.9	0.6		
C1614A	16.2	-20.1	-16.2	3.9	41.0	50.5	-30.3	12.6	-44.4	34.5	-1.9	57.0	13.2	1.1		
Manual Iris Lens (1" format)																
B1214D-2	12.7	-34.3	-12.7	21.7	63.5	67.5	-42.2	8.7	-33.9	23.4	-1.7	20.0	14.4	0.7		
B1218A	12.4	-24.6	-12.4	12.2	39.5	57.8	-31.8	6.9	-29.9	16.6	-3.8	28.8	10.4	0.6		
B2514D	25.1	-25.6	-25.1	0.5	51.4	54.8	-30.3	18.2	-30.8	22.4	-2.8	37.1	15.0	2.6		
B2518	25.0	-22.1	-25.0	-2.9	31.1	57.5	-12.0	14.6	-17.8	10.4	1.4	31.7	14.9	1.2		
B5014A	49.9	-47.3	-49.9	-2.6	57.4	65.5	-8.1	37.5	-28.0	21.0	0.8	59.3	18.1	2.8		
Line Scan Lens																
YF5028A-02	51.4	-80.0	-61.7	18.4	109.7	76.7	-77.2	18.1	-59.0	17.2	-0.1	66.0	33.0	2.9	M=-0.2, Diagonal y=22.5	
YF5028A-035	51.1	-88.1	-69.0	19.0	116.9	76.2	-85.7	13.0	-66.7	17.2	0	67.8	40.7	3.9	M=-0.35, Diagonal y=22.5	
YF/YK5028	※ ※	52.0	-54.8	-52.0	2.8	71.1	103.3	-57.1	18.6	-54.5	19.4	0.2	41.4	37.0	19.7	M=-0.2, Diagonal y=22.5
YF/YK3528	※ ※	36.3	-61.8	-36.3	25.5	89.9	103.3	-72.3	13.2	-51.0	18.6	0.1	34.0	33.2	20.1	M=-0.2, Diagonal y=22.5
UV Lens																
B2528-UV	25.0	-24.9	-25.0	0.2	34.9	42.9	-25.9	-	-26.1	-	-4.1	87.7	12.8	4.1	266nm, y = 8.0	
B7838-UV	77.5	-77.6	-77.5	0.1	96.8	126.8	-78.8	-	-78.8	-	-0.2	98.4	71.3	23.1	250nm, y = 8.0	

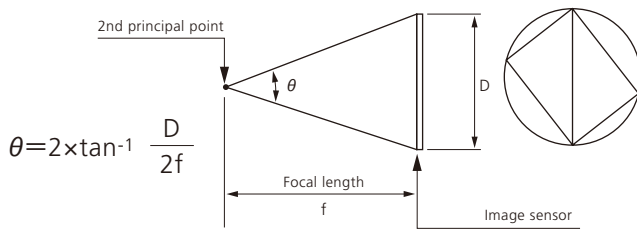
※※ These models adopt a floating mechanism and are not covered by the calculation above. Please contact us for details.

Focal length



Rays from infinitely distant objects are condensed internally in the lens at a common point on the optical axis. The point at which the image sensor of the CCD camera is positioned is called the focal point. By virtue of design, lenses have 2 principal points, 1st principle point and a 2nd principle point. The distance between the 2nd principle point and the focal point (image sensor) determines to focal length of the lens.

Angle of View



The angle formed by the two lines from the 2nd principle point and the edges of the sensor is called the angle of view. Therefore, the focal length of the lens is fixed regardless of the image format size of the CCTV camera. Conversely, the angle of view varies in accordance with the image size. The focal lengths in the catalogue are nominal and the angles of view calculated by the formula referring to the focal lengths are approximate.

F Number

$$\text{F number} = \frac{f}{A}$$

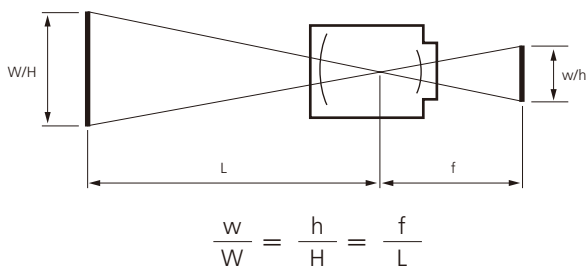
f = focal length
A = effective aperture (diameter of entrance pupil)

The F number is the index for the amount of light that passes through a lens. The smaller the number, the greater the amount of light. The F number is a ratio between the focal length and the effective aperture as follows.

Field of View

The field of view varies along with the focal length of the lens as follows.

* See page 18 for the calculation method for close-up applications.



W : width of object

H : height of object

w : width of image sensor

1" format=12.7mm, 2/3" format=8.8mm,

1/2" format=6.4mm, 1/3" format=4.8mm

h : height of image sensor

1" format=9.525mm, 2/3" format=6.6mm,

1/2" format=4.8mm, 1/3" format=3.6mm

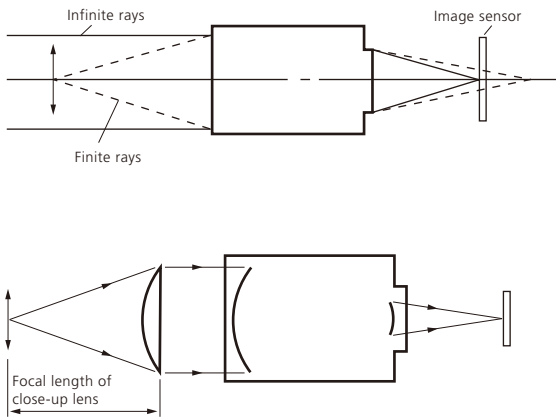
f : focal length

L : object distance

Example: To show the full image of a 2.64m high object positioned 10m away from the camera on a monitor with a 2/3 format camera

$$\frac{h}{H} = \frac{f}{L} \longrightarrow \frac{6.6}{2,640} = \frac{f}{10,000} \longrightarrow f=25\text{mm}$$

Close-Up Application



There are two methods for imaging closer than the minimum object distance of a lens.

1) Extension Tube (Macro Ring)

When the rays originate from a finite object distance, the rays are condensed at a point further than the focal point, while the rays from infinite distance are condensed at the actual focal point. The focus adjustment moves the lens barrel toward the object to shift the focusing point at the image sensor. However, the amount of focusing adjustment is mechanically limited as set by the minimum object distance. Extension Tube (Macro Ring) is inserted in between the lens and the camera to shift

* Do not use a extension tube with a zoom lens.

2) Close-Up Lens

The close-up lens has a positive meniscus lens as a supplementary lens. Generally, 3 types of close-up lenses are available, close-up lens No. 1, 2 and 3 have focal lengths of 1,000mm (1000mm/1), 500mm (1,000mm/2), and 333mm (1,000mm/3), respectively. When an object is placed at the focal point of the close-up lens, the rays from the object are converted by the close-up lens to be parallel rays against the optical axis as seen on the right.

Depth of Field

When an object is focused, it is typically observed that the area in front and behind the object is also in focus. The range in focus is called depth of field. When the background is extended to infinity, the object distance (focusing distance) is called the hyper focal distance. Depth of field is calculated by the following formula.

$$H = \frac{f^2}{C \times F}$$

$$T1 = \frac{B(H+f)}{H+B}$$

$$T2 = \frac{B(H-f)}{H-B}$$

F = F No.

H = hyper focal distance

f = focal length

B = object distance (measured from image sensor)

T1 = near limit

T2 = far limit

C = circle of least confusion

1" format=0.04mm, 2/3" format=0.03mm,

1/2" format=0.02mm, 1/3" format=0.015mm, 1/4" format=0.011mm

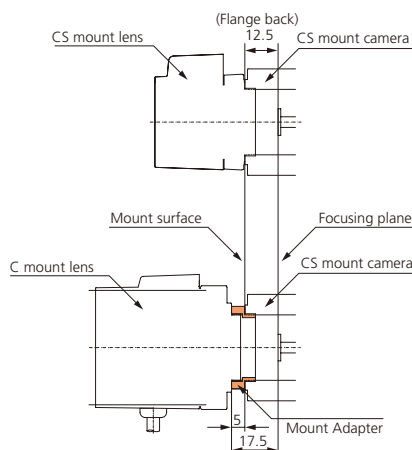
Depth of field increases when:

*Focal length is shorter

*F-number is larger

*Object distance is longer

CS and C Mount



The CS mount has been adopted because it is difficult to manufacture a compact, high-performance, and low-cost mount if the optical design requires a back focus longer than the focal length of the lens. The flange back of a CS mount is about 5mm shorter than that of a C mount, so please use CS mount lens only with a CS mount camera. Install a 5mm Mount adapter between the camera and lens when using a C mount lens with a CS mount camera.

Products Line Up

5 Mega-Pixel Lens												
Model Name	Focal Length (mm)	Iris Range	Mount	Horizontal Angle of View (°)					Filter Size (mm)	Dimensions (DxL)mm	Weight (g)	Remarks
				1/4*format	1/3*format	1/2*format	2/3*format	1*format				
● 2/3 *format												
C814-5M	8.0	1.4-16	C	24.8	32.9	43.2	57.8	—	58 P=0.75	φ 60.8x64	260	Lock Levers and Lock Screws
C1614-5M	16.0	1.4-16	C	12.9	17.1	22.7	30.8	—	40.5 P=0.5	φ 43x47	140	Lock Levers and Lock Screws
C2514-5M	25.0	1.4-16	C	8.2	11.0	14.6	19.9	—	40.5 P=0.5	φ 43x44	130	Lock Levers and Lock Screws

Model Name	Focal Length (mm)	Iris Range	Mount	Optical magnification	Horizontal Field of View (mm)					Filter Size (mm)	Dimensions (DxL)mm	Weight (g)	Remarks
					1/4*format	1/3*format	1/2*format	2/3*format	1*format				
● 2/3 *format													
C5028A-M02	50.0	2.8-22	C	0.15-0.23	24-16	32-21	43-28	59-38	—	52 P=0.75	φ 63.2x99.6	560	Lock Levers
C5028A-M035	50.0	2.8-22	C	0.28-0.4	13-9	17-12	23-16	31-22	—	52 P=0.75	φ 63.2x99.3	580	Lock Levers

Mega-Pixel Lens												
Model Name	Focal Length (mm)	Iris Range	Mount	Horizontal Angle of View (°)					Filter Size (mm)	Dimensions (DxL)mm	Weight (g)	Remarks
				1/4*format	1/3*format	1/2*format	2/3*format	1*format				
● 1/2 *format												
H614-MQ	6.0	1.4-16	C	32.3	44.5	57.4	—	—	—	φ 32x37.5	58	Lock Levers and Lock Screws
H1214-M	12.0	1.4-16	C	16.5	21.9	28.9	—	—	27 P=0.5	φ 29.5x28.5	55	Lock Levers and Lock Screws
● 2/3 *format												
C1614-M	16.0	1.4-16	C	12.9	17.1	22.7	31.0	—	27 P=0.5	φ 29.5x33.2	63	Lock Levers and Lock Screws
C2514-M	25.0	1.4-16	C	8.2	11.0	14.6	20.0	—	27 P=0.5	φ 29.5x32	55	Lock Levers and Lock Screws
C3516-M	35.0	1.6-16	C	6.1	8.1	10.8	14.8	—	27 P=0.5	φ 29.5x35.4	64	Lock Levers and Lock Screws
C5028-M	50.0	2.8-22	C	4.1	5.5	7.3	10.0	—	27 P=0.5	φ 29.5x34	55	Lock Levers and Lock Screws
C7528-M	75.0	2.8-32	C	2.8	3.8	5.0	6.9	—	30.5 P=0.5	φ 34x59.6	125	Lock Levers and Lock Screws

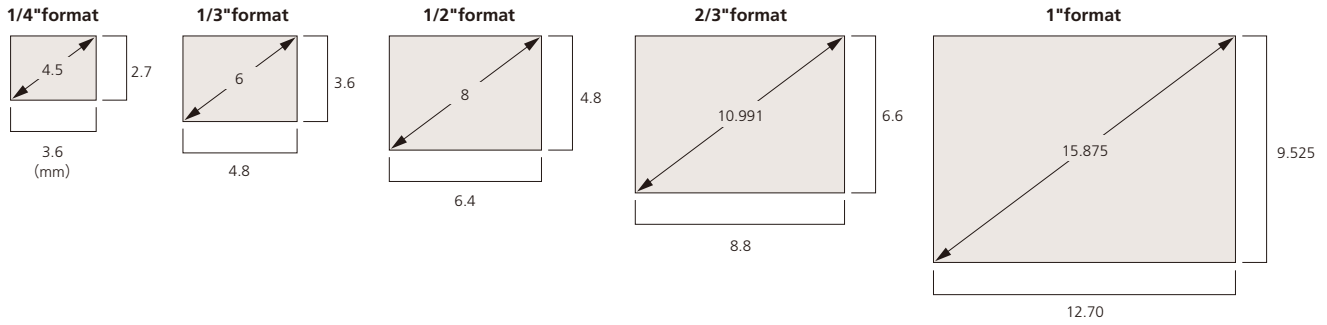
Manual Iris Lens												
Model Name	Focal Length (mm)	Iris Range	Mount	Horizontal Angle of View (°)					Filter Size (mm)	Dimensions (DxL)mm	Weight (g)	Remarks
				1/4*format	1/3*format	1/2*format	2/3*format	1*format				
● 1/2 *format												
H416	4.2	1.6-C	C	47.9	64.3	86.8	—	—	—	φ 42x43.5	120	Lock Levers and Lock Screws
H612A	6.0	1.2-C	C	33.0	43.5	56.9	—	—	40.5 P=0.5	φ 42x46	125	Lock Levers and Lock Screws
H1212B	12.0	1.2-22	C	16.9	22.6	30.2	—	—	27 P=0.5	φ 30x35.5	67	Lock Levers and Lock Screws
● 2/3 *format												
C418DX	4.8	1.8-C	C	41.7	55.1	72.4	96.4	—	—	φ 40.5x35.5	105	Lock Levers and Lock Screws
C815B	8.5	1.5-C	C	24.0	31.9	42.1	56.5	—	40.5 P=0.5	φ 42x40	120	Lock Levers and Lock Screws
C1614A	16.0	1.4-22	C	12.7	16.9	22.5	30.7	—	27 P=0.5	φ 30x33	58	Lock Levers and Lock Screws
● 1 *format												
B1214D-2	12.5	1.4-C	C	16.1	21.4	28.4	38.5	53.7	40.5 P=0.5	φ 42x50	135	Lock Levers and Lock Screws
B1218A	12.5	1.8-C	C	16.5	22.0	29.1	39.6	55.5	40.5 P=0.5	φ 42x40	95	Lock Levers and Lock Screws
B2514D	25.0	1.4-22	C	8.2	11.0	14.6	20.1	29.0	27 P=0.5	φ 30x37.3	76	Lock Levers and Lock Screws
B2518	25.0	1.8-C	C	8.2	11.0	14.6	19.9	28.2	40.5 P=0.5	φ 42x40	87	Lock Levers and Lock Screws
B5014A	50.0	1.4-C	C	4.1	5.5	7.3	10.0	14.4	46 P=0.75	φ 48x48	180	Lock Levers and Lock Screws

Manual Zoom Lens												
Model Name	Focal Length (mm)	Iris Range	Mount	Horizontal Angle of View (°)					Filter Size (mm)	Dimensions (DxL)mm	Weight (g)	Remarks
				1/4*format	1/3*format	1/2*format	2/3*format	1*format				
● 1/2 *format												
H6Z810	8.0-48	1.0-22	C	24.9-4.4	33.0-5.8	43.3-7.7	—	—	55 P=0.75	φ 57x95	430	Manual iris, Lock Levers
● 2/3 *format												
C6Z1218	12.5-75	1.8-22	C	16.1-2.7	21.4-3.7	28.4-4.9	38.8-6.7	—	49 P=0.75	φ 51x90	320	Manual iris

Line Scan Lens												
Model Name	Focal Length (mm)	Iris Range	Mount	Optical magnification	Field of View (mm)			Filter Size (mm)	Dimensions (DxL)mm	Weight (g)	Remarks	
					4,096x7μm	7,450x4.7μm	4,096x10μm					
YF5028A-02	50.0	2.8-22	F	0.15-0.23	191-125	234-152	273-178	52 P=0.75	φ 60x63.6	425	Not for Photographic Cameras	
YF5028A-035	50.0	2.8-22	F	0.28-0.4	102-72	125-88	146-102	52 P=0.75	φ 60x70.4	435	Not for Photographic Cameras	
YF3528 YK3528	35.0	2.8-22	F K	∞-0.5	57(Optical magnification: 0.5x)	70(Optical magnification: 0.5x)	81(Optical magnification: 0.5x)	62 P=0.75	φ 72x56.8 φ 72x57.8	380	Not for Photographic Cameras	
YF5028 YK5028	50.0	2.8-22	F K	∞-0.5	39.9(Optical magnification: 0.5x)	52.6(Optical magnification: 0.5x)	64.5(Optical magnification: 0.5x)	62 P=0.75	φ 72x56.8 φ 72x57.8	370	Not for Photographic Cameras	

UV Lens												
Model Name	Focal Length (mm)	Iris Range	Mount	Horizontal Angle of View (°)					Filter Size (mm)	Dimensions (DxL)mm	Weight (g)	Remarks
				1/4*format	1/3*format	1/2*format	2/3*format	1*format				
● 1 *format												
B2528-UV	25.0	2.8-16	C	8.3	11.1	14.8	20.4	29.7	25.5 P=0.5	φ 30x25.4	33	365nm wavelength supported.
B7838-UV	78.0	3.8-16	C	2.7	3.5	4.7	6.5	9.5	49 P=0.75	φ 62.5x109.3	446	365nm wavelength supported.

Format Size



Model Name	1/4Format Angle of View (°)			1/3Format Angle of View (°)			1/2Format Angle of View (°)			2/3Format Angle of View (°)			1Format Angle of View (°)		
	Diagonal	Horizontal	Vertical	Diagonal	Horizontal	Vertical	Diagonal	Horizontal	Vertical	Diagonal	Horizontal	Vertical	Diagonal	Horizontal	Vertical

5 Mega-Pixel Lens																
C814-5M	30.9	24.8	18.7	40.7	32.9	24.8	53.1	43.2	32.9	69.4	57.8	44.5	—	—	—	
	C1614-5M	16.0	12.9	9.7	21.3	17.1	12.9	28.1	22.7	17.1	37.9	30.8	23.4	—	—	—
C2514-5M	10.3	8.2	6.2	13.7	11.0	8.2	18.2	14.6	11.0	24.7	19.9	15.0	—	—	—	
2/3" format C5028A-M02	0.15X	4.3	3.5	2.6	5.8	4.6	3.5	7.7	6.2	4.6	10.6	8.5	6.4	—	—	—
	0.2X	4.2	3.3	2.5	5.5	4.4	3.3	7.4	5.9	4.4	10.1	8.1	6.1	—	—	—
	0.23X	4.1	3.2	2.4	5.4	4.3	3.2	7.2	5.8	4.3	9.9	7.9	5.9	—	—	—
C5028A-M035	0.28X	3.9	3.1	2.4	5.2	4.2	3.1	7.0	5.6	4.2	9.5	7.6	5.7	—	—	—
	0.35X	3.7	3.0	2.2	4.9	4.0	3.0	6.6	5.3	4.0	9.0	7.2	5.4	—	—	—
	0.4X	3.6	2.9	2.1	4.8	3.8	2.9	6.3	5.1	3.8	8.7	7.0	5.2	—	—	—

Mega-Pixel Lenses																
1/2" format	H614-MQ	40.8	32.3	24.9	58.6	44.5	33.9	69.0	57.4	44.3	—	—	—	—	—	—
	H1214-M	20.5	16.5	12.4	27.2	21.9	16.5	35.7	28.9	21.9	—	—	—	—	—	—
2/3" format	C1614-M	16.0	12.9	9.7	21.3	17.1	12.9	28.2	22.7	17.1	38.3	31.0	23.4	—	—	—
	C2514-M	10.3	8.2	6.2	13.7	11.0	8.2	18.2	14.6	11.0	24.9	20.0	15.1	—	—	—
	C3516-M	7.6	6.1	4.6	10.1	8.1	6.1	13.4	10.8	8.1	18.4	14.8	11.1	—	—	—
	C5028-M	5.2	4.1	3.1	6.9	5.5	4.1	9.1	7.3	5.5	12.5	10.0	7.5	—	—	—
	C7528-M	3.5	2.8	2.1	4.7	3.8	2.8	6.3	5.0	3.8	8.6	6.9	5.2	—	—	—

Manual Iris Lens																
1/2" format	H416	60.1	47.9	35.8	81.0	64.3	47.9	110.2	86.8	64.3	—	—	—	—	—	—
	H612A	40.9	33.0	24.8	53.7	43.5	33.0	68.9	56.9	43.5	—	—	—	—	—	—
	H1212B	21.2	16.9	12.7	28.3	22.6	16.9	37.8	30.2	22.6	—	—	—	—	—	—
2/3" format	C418DX	51.8	41.7	31.4	68.1	55.1	41.7	88.7	72.4	55.1	115.9	96.4	74.5	—	—	—
	C815B	29.9	24.0	18.1	39.6	31.9	24.0	51.9	42.1	31.9	67.9	56.5	43.3	—	—	—
1" format	C1614A	15.9	12.7	9.5	21.1	16.9	12.7	28.0	22.5	16.9	38.2	30.7	23.2	—	—	—
	B1214D-2	20.1	16.1	12.1	26.7	21.4	16.1	35.2	28.4	21.4	47.3	38.5	29.2	64.8	53.7	41.4
	B1218A	20.6	16.5	12.4	27.3	22.0	16.5	36.1	29.1	22.0	48.7	39.6	30.0	67.2	55.5	42.6
	B2514D	10.3	8.2	6.2	13.7	11.0	8.2	18.3	14.6	11.0	25.1	20.1	15.1	36.1	29.0	21.7
	B2518	10.3	8.2	6.2	13.7	11.0	8.2	18.1	14.6	11.0	24.6	19.9	15.0	34.8	28.2	21.4
B5014A	5.2	4.1	3.1	6.9	5.5	4.1	9.1	7.3	5.5	12.5	10.0	7.5	17.9	14.4	10.9	

Manual Zoom Lens																
1/2" format	H6Z810	31.0-5.5	24.9-4.4	18.8-3.3	40.7-7.2	33.0-5.8	24.9-4.4	52.7-9.5	43.3-7.7	33.0-5.8	—	—	—	—	—	—
2/3" format	C6Z1218	20.1-3.4	16.1-2.7	12.1-2.1	26.7-4.6	21.4-3.7	16.1-2.7	35.3-6.1	28.4-4.9	21.4-3.7	48.0-8.3	38.8-6.7	29.3-5.0	—	—	—

UV Lens																
1/2" format	B2528-UV	10.4	8.3	6.2	13.9	11.1	8.3	18.9	14.8	11.1	25.5	20.4	15.3	37.2	29.7	22.2
	B7838-UV	3.3	2.7	2.0	4.4	3.5	2.7	5.9	4.7	3.5	8.1	6.5	4.9	11.8	9.5	7.1

Manual Iris Lens / Line-Scan Lens / UV Lens

Y K 5028 A □ -02
1 **2** **3** **4** **5** **6** **11**

Auto-Iris Lens

B □ 2514 □ E R
1 **2** **3** **4** **5** **6** **11**

Motorized Zoom Lens / Manual Zoom Lens

T S 15 Z A M E -3 F
1 **2** **7** **8** **5** **9** **10** **11**

Vari-Focal Lens

T S 2 V 2 14 A E D
1 **2** **7** **8** **3** **4** **5** **9**

Board Camera Lens

Q D 2 V 22 14 B E -DN
1 **2** **7** **8** **3** **4** **5** **9** **11**

1 Format Size

Sign	Detail
Y	Larger than 1" format
B	1" format
C	2/3" format
H	1/2" format
T	1/3" format
Q	1/4" format

2 Mount

Sign	Detail
none	C mount
S	CS mount
D	Board mount
K	K mount
F	F mount

3 Focal Length

Shown in integer, omit fractions
 Example: QD2V2214AE (f =2.2mm)
 QD2V2814AE (f =2.8mm)

4 Maximum Aperture

Omit decimal point
 Example: QD2V2214AE (maximum aperture = 1.4mm)

5 History of Improvements

This outlines the history of improvements of the same lens, shown with a letter in alphabetical order: A, B, C, D. The signs of **6** and **9** are not used *1

6 Focus-Iris Specification [used in combination]

Sign	Detail
X	Fixed Focus
E	Auto Iris
P	Pinhole

7 Zoom Ratio

Magnification is shown in integers.

8 Zoom Sign

Sign	Detail
Z	Zoom Lens
V	Vari-Focal Lens

9 Focus-Zoom-Iris

[used in combination, in the order of M, E, D]

Sign	Detail
M	Motor Driven
E	Auto Iris
D	DC Iris

10 Control Voltage & Method [shown after – (hyphen)]

Sign	Detail
1	DC6V Polarity Switching Type
2	DC ± 12V Common Type
3	DC ± 6V Common Type
5	DC12V Polarity Switching Type

11 Other Features

[Shown after – (hyphen). Usable in combination]*2

Sign	Detail
Numbers such as 02	Optical Magnification (Used only when there is a special need to describe it as a product feature. Decimal point omitted.)
DN	Day & Night Lens
UV	UV Lens
M	Mega-Pixel Lens
R	Iris with Manual Override
P	Preset
F	Preset & Iris Manual Override
I	IR-Coated Lens
H	High Speed Zoom/ Focus

Example

UVM: UV lens compatible with mega-pixel cameras

RI: IR-coated lens with manual override function

*1 "D" is used only with manual iris lenses in the History of Improvements.

Example : B1214D-2,C418DX,B2514D

*2 "-2" in B1214D-2 indicates the series name of the lens when it was released. It does not indicate the voltage, power supply type, or optical magnification.

RICOH
imagine. change.

RICOH COMPANY, LTD.
3-2-3, Shin-yokohama, Kohoku-ku, Yokohama-shi
Kanagawa, 222-0033 Japan
Tel: +81-45-477-1552
Fax: +81-45-477-1866