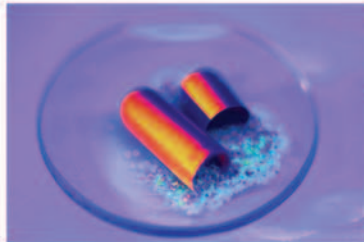




INSPECTION | MACHINE VISION | RESEARCH



OPTEM ZOOM 125C

12.5:1 LENS SYSTEM

EXTENDED ZOOM RANGE
Maximum Imaging Versatility

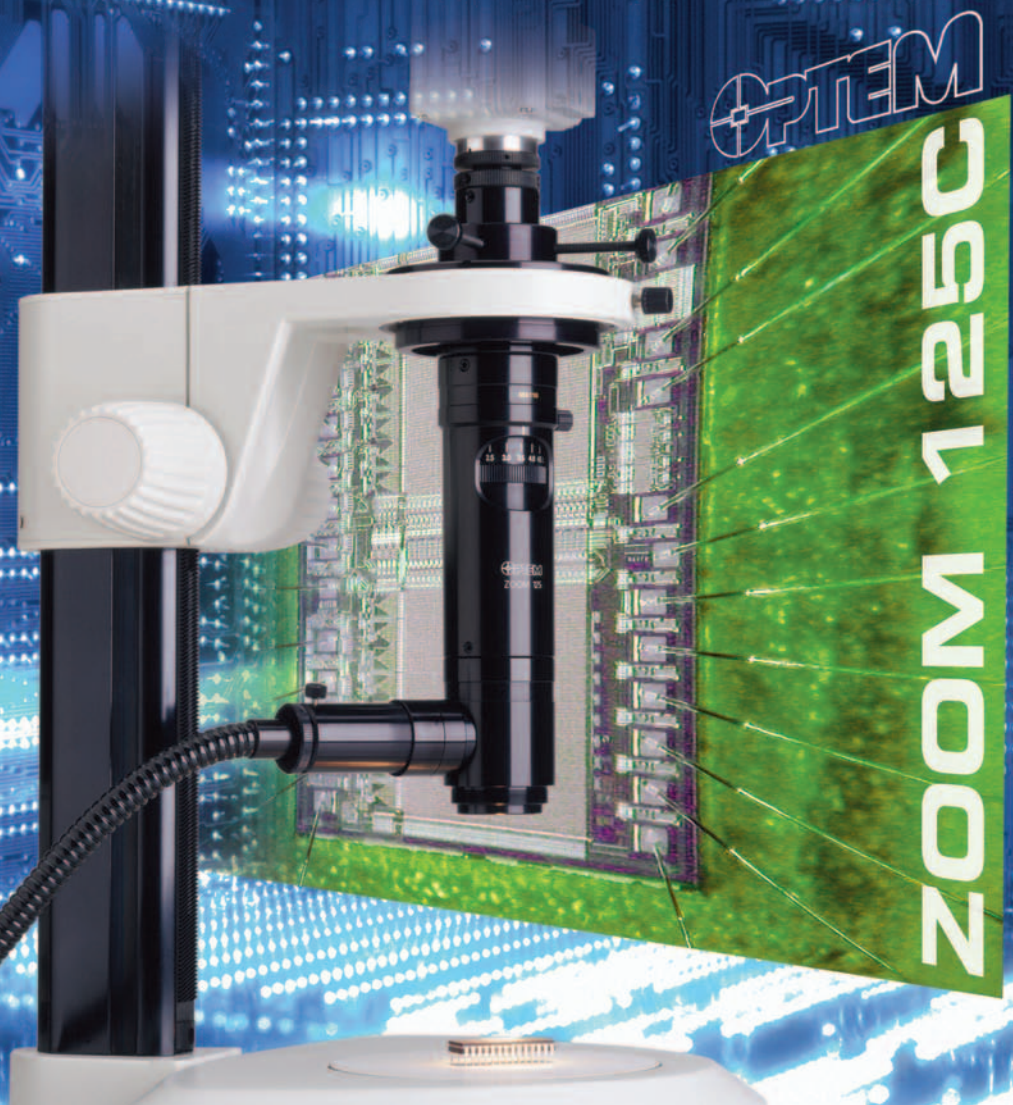
www.qioptiqimaging.com

QIOPTIQ
Optics with Intelligence

Qioptiq Imaging Solutions

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EXTENDED ZOOM RANGE AND MODULAR FLEXIBILITY

The Optem® Zoom 125C Optical System is designed to deliver extended micro-imaging zoom performance. The Zoom 125C features the imaging precision and signature modular flexibility that makes Optem Zoom Lens Systems a cornerstone in today's high-tech manufacturing and OEM integrator micro-imaging applications.



Zoom 125C Specs

Zoom Range	12.5:1
Magnification Range.....	0.52 – 6.5X
Resolution	57 – 300 lp/mm
Numerical Aperture	0.019 – 0.10
Depth-of-Field	1.57 – 0.057 mm
Field-of-View (Low-Mag.)	9.23 x 12.31 mm
Field-of-View (High-Mag.)	0.74 x 0.98 mm
Working Distance	89 mm

*Specs shown in order of low to high mag.
Nominal 1X/1X Configuration with 1/2" Camera*

NEW FOR ZOOM 125C

IMPROVED Illumination Uniformity

Under continuous refinement, the Zoom 125C has been re-engineered to reduce vignetting at low magnification by as much as 50%. These improvements ensure optimal camera performance, improved algorithmic accuracy and reduced image processing requirements at front-end integration.

NEW LED Coaxial Illuminators

Programmable 1-Watt white-light Coaxial LED Illuminators feature compact design and lightweight cable for streamlined OEM integration. **PAGE 4**

NEW Infinity Macro Lens

From millimeters to meters... this simple lens converts your Zoom 125C from micro-imaging at close working distances to a powerful macro-imaging lens covering broad fields-of-view from 55mm to infinity. **PAGE 4**

NEW Optem M-Plan APO Objectives

Get the most from your high magnification imaging. Specify the newly expanded line of Optem Long-Working Distance Objectives, including the new M-Plan APO family for exceptional color accuracy and field-flatness. **PAGE 4**

Follow the seven easy steps below to configure the Zoom 125 Lens System that meets your optical, functional and physical configuration needs.

- 2 Cross reference your desired performance block and note the **TV Tube magnification** (*TOP axis*) and **Auxiliary Lens magnification** (*LEFT axis*) to arrive at the combination of magnification components needed to yield your desired field-of-view [FOV]... Consider the varying resolution, depth-of-field and/or working distance factors that are dictated by these components.

- 3** Once you have determined the **TV Tube** and **Auxiliary Lens magnifications** required, navigate down through the System Diagram (PAGE 6-7) starting from the camera. Select the physical shape of TV Tube and/or camera mount type desired.

- 4** Select the **Upper Zoom Module** with the functional features you require... Manual, Iris, detent and DC or Stepper Motorized Zoom options are available.

- 5** Combine the Upper Zoom Module with one of the **Lower Function Modules** that incorporates manual or motorized fine focus and/or coaxial illumination options.

- 6** Now specify the correct **Auxiliary Lens magnification** to complete the optical components of your Zoom 125C Lens System as dictated in step-1 above. By default, the Zoom 125C delivers a 1X configuration without an Auxiliary Lens.

- 7** Finally outfit your Zoom 125C Lens System with the appropriate **Coaxial** or **Ringlight Illumination accessories**. If you chose motorized zoom or focus functions, select the appropriate **DC or Stepper controller and power supply**. You may also wish to specify **mounting hardware** to ease integration.



Components of Functional Zoom 125C

- TV Tube (Top Magnification)
- Upper Zoom Module
- Lower Function Module
- Auxiliary Lens (Bottom Magnification)

The Upper Zoom Module determines the optomechanical function of your Zoom 125C Lens System... Select from Manual, Detented, and DC or Stepper Motorized.

Manual Zoom - Hand-driven zoom presents an economical 12.5:1 optical system.

Detented Zoom – Obtain specific "stops" throughout the zoom range by selecting the Zoom 125C Module with Detents. Typically used in measuring systems where each position may be calibrated. Pre-set stops are located at 0.6X, 1.0X, 2.0X, 3.0X, 4.0X, 5.0X, and 6.0X.

Motorized Zoom – Provides remote and automatic operation. Available with either DC or Stepper motor drives. The Stepper motor version has a companion RS232 Controller which may be purchased as a free-standing unit or as just the PC board for OEM integration.



Iris-Equipped Zoom Modules – All Zoom 125C Upper Modules are available with an optional integral iris for better control of light level and increased depth-of-field.

Function Modules introduce various illumination and focus options to your Zoom 125C Lens System.

Basic Lower Function Module – The Standard function module houses just the removable A-B Lens Cell yielding the default 1.0X magnification. *(NOTE: All Zoom 125C Lower Function Modules contain an A-B Lens Cell which permits working at finite conjugates)*. With the lens cell removed, the zoom lens works at infinity and will accept infinity-corrected objectives for higher-magnification imaging.

5mm/15mm Focus – Ideal for installations without adjustable support or stage systems, Zoom 125C Fine Focus provides 5mm (coaxial models only) or 15mm (non-coaxial models) fine focus axial distance at the object. Available in manual and motorized.



Coaxial Illumination – Provides a port for the injection of incidental light via LED, Fiber Optic and Halogen Illuminator options. Coaxial Lower Function Modules are available with Internal 5mm Focus in manual or motorized versions. Additionally, each coaxial version is available with a built-in Analyzer for better control in polarized applications.





ILLUMINATION OPTIONS

The Zoom 125C Lens System offers a variety of illumination options to meet a multitude of imaging requirements.

LED Coaxial Illuminators – Compatible with all Zoom 125C Coaxial Lower Function Modules, new Programmable 1-Watt LED Coaxial Illuminators offer reduced power requirement and heat generation with substantial service life gains.



Available in Straight and Right-Angle configurations, Optem Coaxial LEDs feature compact designs and simplified cable management. Driven by a compact single-channel programmable controller, Optem Coaxial LEDs emit brilliant cool light in the visible spectrum and deliver virtually identical optical performance to our traditional Fiber Optic Coaxial Illuminator.

Fiber Optic Coaxial Illuminators – Available with 40 and 60-inch flexible fiber bundles powered by 110V or 220V Optem VSI Fiber Optic Illuminators.

Polarized Light – When imaging highly reflective subjects, Polarizer Modules with built-in Analyzers are available to introduce polarization to both LED and Fiber Optic Coaxial Illumination paths.



Halogen Illuminators – An economical light source alternative to brighter fiber optic illumination for coaxial Zoom 125C Lower Function Modules.

Fiber Optic Ring Lights – Oblique ringlight illumination is ideal to better define dimension-rich subjects. Driven with the same VSI Fiber Optic Illuminators as conventional coaxial systems, Optem Ringlights either feature the fiber optic cable exiting the ring horizontally (90° off optical axis), or vertically (30° off optical axis). A special Objective Ring Light is required when incorporating oblique illumination with Optem Objectives.



MOTORIZING YOUR ZOOM 125C

The Zoom 125C Optical System can be specified with motorized zoom and/or focus functions.

Stepper Motor Models – Stepper Motors feature Hall-Effect Sensors to ensure pinpoint mechanical accuracy and repeatability. Homing Sensors establish a “zero” position, permitting programming of setups for multiple work pieces. Control and power are easily integrated through RS232 serial port interface with a Rocker Switch Controller and Windows GUI. An OEM Board is available for more streamlined OEM integration. A Stepper Motor VI library is available for LabVIEW.



DC Motor Models

DC Motors allow continuous movement throughout either the zoom or focus range. Two RS232 Serial ports in the back of the DC Motor Controller accept both zoom and focus motorized functions.

LONG-WORKING DISTANCE OBJECTIVES

Achieve significantly higher magnifications and increased resolution. Combine your Zoom 125C with the expanded line of Optem Infinity-Corrected Objectives.

Optem M-Plan APO – Eliminate Chromatic aberration across exceptionally flat fields for the ultimate in high-magnification accuracy. Select from 2X, 5X, 10X, 20X and 50X Long-Working Distance Objectives. These objectives are exact replacements for Mitutoyo Series 378 Objectives and are ideal for metrology applications.



Optem High-Resolution

Specifically designed to capture maximum resolution at the high-end magnifications of Optem Zoom Lenses, the 5X, 10X and 20X Optem HR Objectives are ideal when every detail counts.

NEW INFINITY MACRO LENS

When macro imaging of broader fields-of-view across longer working distances is required, integrate the new Infinity Macro Lens accessory below a Fine-Focus Module and image from 50mm out to infinity.



ZOOM 125C PERFORMANCE SPECIFICATIONS

 -- Configuration not recommended

Flange Mounts (for manual versions)

- 30-15-06-000**
76mm O.D. FLANGE MOUNT
(OLYMPUS, NIKON, LEICA)
- 30-15-02-000**
82mm O.D. FLANGE MOUNT
(UNITRON)
- 30-15-03-000**
83mm O.D. FLANGE MOUNT
(GENERIC)
- 30-15-04-000**
84mm O.D. FLANGE MOUNT
(MEIJ)

30-15-00-000
FLAT FLANGE MOUNT
(for Manual versions)



Tube Clamp Mounts (for motorized versions)

- 30-25-76-000**
76mm O.D. TUBE CLAMP
(OLYMPUS, NIKON, LEICA)
- 30-25-82-000**
82mm O.D. TUBE CLAMP
(UNITRON)
- 30-25-83-000**
83mm O.D. TUBE CLAMP
(GENERIC)
- 30-25-84-000**
84mm O.D. TUBE CLAMP
(MEIJ)

30-65-34-000
FLAT MOUNT
(for Motorized versions)



29-50-10-000
UNIVERSAL CLAMP
(top view)



29-60-83-000
VSI 110 ILLUMINATOR
110 VOLT / 150 WATT

29-60-84-000
VSI 220 ILLUMINATOR
220VOLT / 150 WATT



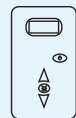
- 30-16-40-000**
40" FLEX
BUNDLE
- 30-16-60-000**
60" FLEX
BUNDLE



- 30-16-01-000**
10mm
ADAPTER
- 30-16-02-000**
FIBER OPTIC
LAMPHOUSE



396010-810
SINGLE-CHANNEL
PROGRAMMABLE
LED CONTROLLER



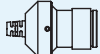
- 27-60-07-000**
110/6 VOLT VARIABLE
- 27-60-17-000**
220/6 VOLT VARIABLE



29-60-09-000
10 WATT
HALOGEN LAMP



30-60-10-000 **NEW**
STRAIGHT
1-WATT COAXIAL LED



30-60-20-000 **NEW**
RIGHT-ANGLE
1-WATT COAXIAL LED



30-60-20-000
RIGHT-ANGLE
1-WATT COAXIAL LED



29-69-14-000
HALOGEN
LAMPHOUSE



Illumination

29-69-13-000
RIGHT ANGLE
COAX ADAPTER



29-69-02-000
POLARIZER



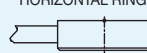
29-69-20-000
M25x0.75
VARIABLE MAG/WD
RING-LIGHT
ADAPTER



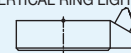
29-69-21-000
FIXED MAG/WD
RING-LIGHT
ADAPTER



29-60-81-000
HORIZONTAL RING LIGHT



30-16-70-000
VERTICAL RING LIGHT

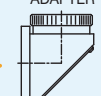


NEW

42-35-41-000
INFINITY
MACRO LENS



29-99-59-000
RIGHT ANGLE
ADAPTER

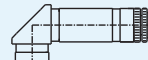


29-20-09-000
0.18X / 0.25X
CONVERTIBLE
AUX LENS



Right-Angle TV Tubes

- 29-90-86-000** - 0.5X RA
- 29-90-87-000** - 0.67X RA
- 29-90-74-000** - 1.0X RA
- 29-90-88-000** - 1.5X RA
- 29-90-89-000** - 2.0X RA



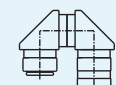
Mini TV Tubes

- 29-90-26-000**
0.5X MINI
TV TUBE
- 29-90-27-000**
0.67X MINI
TV TUBE
- 29-90-90-000**
1.0X MINI
TV TUBE



**U-Bend
TV Tube**

29-90-81-000
1.0X U-BEND
TV TUBE



Upper Zoom Modules

30-61-10-000
MANUAL



30-61-11-000
MANUAL w/IRIS



30-61-40-000
MANUAL DETENT



30-61-41-000
MANUAL DETENT w/IRIS



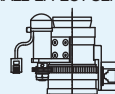
30-13-10-000
15mm FINE FOCUS
MANUAL



30-13-20-000
15mm FINE FOCUS
DC MOTOR



30-13-37-000
15mm FINE FOCUS
STEPPING MOTOR
HALL-EFFECT SENSOR



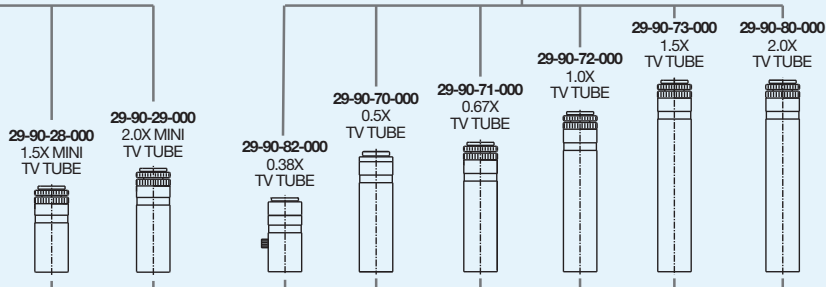
30-12-00-000
BASIC



Zoom 125C System Diagram

CAMERA

Standard TV Tubes

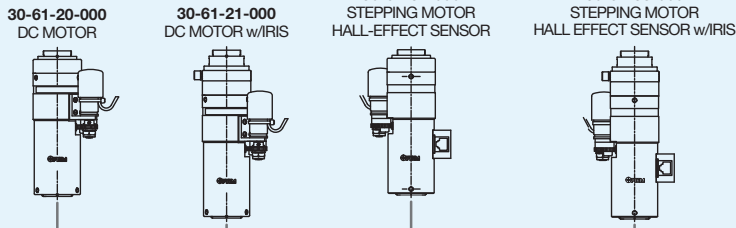


Non-Inverting Right-Angle TV Tubes

29-90-92-000 - 0.5X NIRA
 29-90-93-000 - 0.67X NIRA
 29-90-94-000 - 1.0X NIRA
 29-90-95-000 - 1.5X NIRA
 29-90-96-000 - 2.0X NIRA

Bayonet TV Tubes

29-77-04-000 - 1.0X F-MOUNT BAYONET
 29-77-02-000 - 1.0X 1/2" ENG BAYONET
 29-77-03-000 - 1.0X 2/3" ENG BAYONET
 29-77-01-000 - 1.0X 1/2" SONY BAYONET



Motorization Control & Power Supply

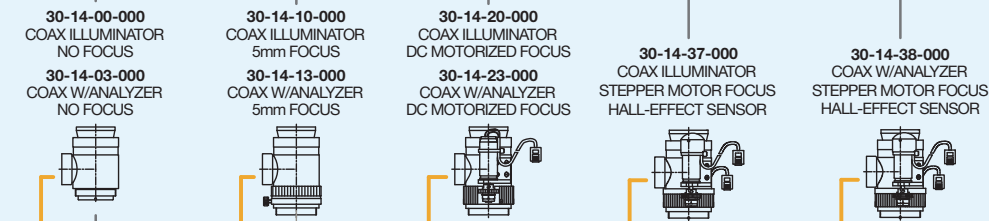
DC MOTOR

28-80-18-000 110V TRANSFORMER

28-80-19-000 220V TRANSFORMER

30-17-20-000 DC MOTOR DRIVER

Lower Function Modules



STEPPER MOTOR

30-17-70-000 STEPPING MOTOR DRIVER

30-17-74-000 HALL EFFECT SENSOR JUNCTION BOX

30-17-75-000 STEPPING MOTOR O.E.M. BOARD

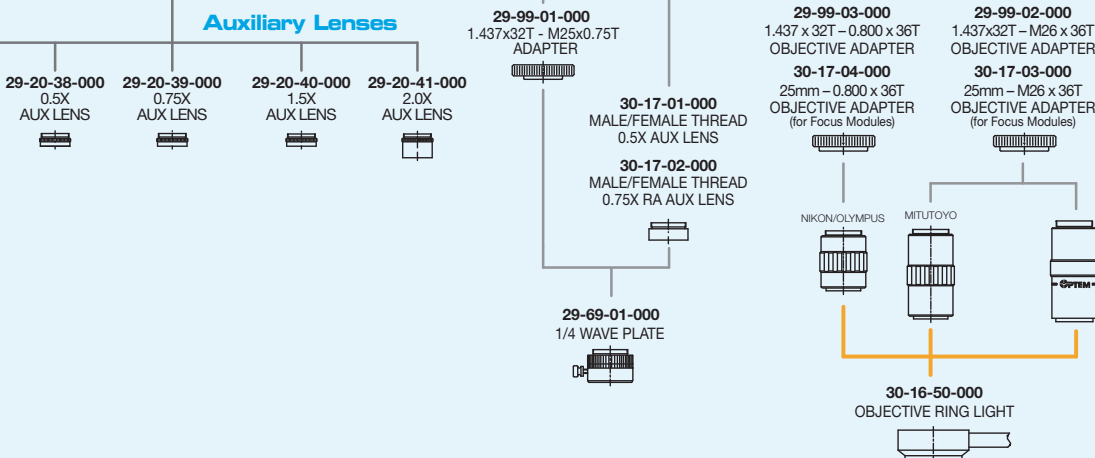
30-17-31-000 UNIV. TRANSFORMER (100-240V, 50-60Hz)

30-70-01-000 (N. AMER CORD)

30-17-36-000 (EUR CORD)

30-17-33-000 (UK CORD)

Magnification



NEW Optem® LWD Objectives

28-21-02-000 - 2X M PLAN APO
 28-21-05-000 - 5X M PLAN APO
 28-21-10-000 - 10X M PLAN APO
 28-21-11-000 - 20X M PLAN APO
 28-21-50-000 - 50X M PLAN APO
 28-20-44-000 - 5X HIGH-RES
 28-20-45-000 - 10X HIGH-RES
 28-20-46-000 - 20X HIGH-RES

— = optomechanical path
 — = illumination path
 — = power/controls path

For an online archive of nominal component dimensions, downloadable schematics, and optical performance specifications, visit the Zoom 125C Section of our web site.

SUBSTAGE/OBLIQUE ILLUMINATION Zoom 125C Optical Performance Matrix

			0.375X TV Tube		0.5X TV Tube		0.67X TV Tube		1.0X TV Tube		1.5X TV Tube		2.0X TV Tube	
			Low Mag	High Mag	Low Mag	High Mag	Low Mag	High Mag	Low Mag	High Mag	Low Mag	High Mag	Low Mag	High Mag
0.18X Aux Lens 29-20-09-000 WD: 468 mm	FOV Cam Format	NA	0.0035	0.015	0.0035	0.015	0.0035	0.015	0.0035	0.015	0.0035	0.015	0.0035	0.015
		LP/mm	11	45	11	45	11	45	11	45	11	45	11	45
		Mag	0.035	0.44	0.047	0.59	0.063	0.78	0.094	1.2	0.14	1.8	0.19	2.3
		DOF	46.29	2.52	46.29	2.52	46.29	2.52	46.29	2.52	46.29	2.52	46.29	2.52
		1/4"	78.63 x 104.84	6.29 x 8.39	58.97 x 78.63	4.72 x 6.29	44.01 x 58.68	3.52 x 4.69	29.49 x 39.32	2.36 x 3.15	19.66 x 26.21	1.57 x 2.10	14.74 x 19.66	1.18 x 1.57
		1/3"	76.19 x 101.59	8.21 x 10.94	76.92 x 102.56	6.15 x 8.21	57.41 x 76.54	4.59 x 6.12	38.46 x 51.28	3.08 x 4.10	25.64 x 34.19	2.05 x 2.74	19.23 x 25.64	1.54 x 2.05
0.25X Aux Lens 29-20-09-000 WD: 310 mm	FOV Cam Format	1/2"	35.56 x 47.41	10.94 x 14.59	76.19 x 101.59	8.21 x 10.94	76.54 x 102.05	6.12 x 8.16	51.28 x 68.38	4.10 x 5.47	34.19 x 45.58	2.74 x 3.65	25.64 x 34.19	2.05 x 2.74
		2/3"	-- x --	-- x --	33.33 x 44.44	11.28 x 15.04	68.41 x 91.21	8.42 x 11.23	70.51 x 94.02	5.64 x 7.52	47.01 x 62.68	3.76 x 5.01	35.26 x 47.01	2.82 x 3.76
		1"	-- x --	-- x --	-- x --	-- x --	28.43 x 37.91	12.25 x 16.33	76.19 x 101.59	8.21 x 10.94	68.38 x 91.17	5.47 x 7.29	51.28 x 68.38	4.10 x 5.47
		NA	0.0048	0.025	0.0048	0.025	0.0048	0.025	0.0048	0.025	0.0048	0.025	0.0048	0.025
		LP/mm	14	75	14	75	14	75	14	75	14	75	14	75
		Mag	0.049	0.61	0.065	0.81	0.087	1.09	0.130	1.6	0.20	2.4	0.26	3.3
0.5X Aux Lens 29-20-38-000 WD: 178 mm	FOV Cam Format	DOF	24.61	0.91	24.61	0.91	24.61	0.91	24.61	0.91	24.61	0.91	24.61	0.91
		1/4"	56.62 x 75.49	4.53 x 6.04	42.46 x 56.62	3.40 x 4.53	31.69 x 42.25	2.54 x 3.38	21.23 x 28.31	1.70 x 2.26	14.15 x 18.87	1.13 x 1.51	10.62 x 14.15	0.85 x 1.13
		1/3"	54.86 x 73.14	5.91 x 7.88	55.38 x 73.85	4.43 x 5.91	41.33 x 55.11	3.31 x 4.41	27.69 x 36.92	2.22 x 2.95	18.46 x 24.62	1.48 x 1.97	13.85 x 18.46	1.11 x 1.48
		1/2"	25.60 x 34.13	7.88 x 10.50	54.86 x 73.14	5.91 x 7.88	55.11 x 73.48	4.41 x 5.88	36.92 x 49.23	2.95 x 3.94	24.62 x 32.82	1.97 x 2.63	18.46 x 24.62	1.48 x 1.97
		2/3"	-- x --	-- x --	24.00 x 32.00	8.12 x 10.83	49.25 x 65.67	6.06 x 8.08	50.77 x 67.69	4.06 x 5.42	33.85 x 45.13	2.71 x 3.61	25.38 x 33.85	2.03 x 2.71
		1"	-- x --	-- x --	-- x --	-- x --	20.47 x 27.28	8.82 x 11.76	54.86 x 73.14	5.91 x 7.88	49.23 x 65.64	3.84 x 5.25	36.92 x 49.23	2.95 x 3.94
0.75X Aux Lens 29-20-39-000 WD: 114 mm	FOV Cam Format	NA	0.010	0.050	0.010	0.050	0.010	0.050	0.010	0.050	0.010	0.050	0.010	0.050
		LP/mm	30	150	30	150	30	150	30	150	30	150	30	150
		Mag	0.098	1.2	0.13	1.6	0.17	2.2	0.26	3.3	0.39	4.9	0.52	6.5
		DOF	5.67	0.23	5.67	0.23	5.67	0.23	5.67	0.23	#DIV/0!	0.23	5.67	0.23
		1/4"	28.31 x 37.74	2.26 x 3.02	21.23 x 28.31	1.70 x 2.26	15.84 x 21.13	1.27 x 1.69	10.62 x 14.15	0.85 x 1.13	7.08 x 9.44	0.57 x 0.75	5.31 x 7.08	0.42 x 0.57
		1/3"	27.43 x 36.57	2.95 x 3.94	27.69 x 36.92	2.22 x 2.95	20.67 x 27.55	1.65 x 2.20	13.85 x 18.46	1.11 x 1.48	9.23 x 12.31	0.74 x 0.98	6.92 x 9.23	0.55 x 0.74
1.0X Config. NO LENS REQ'D WD: 89 mm	FOV Cam Format	1/2"	12.80 x 17.07	3.94 x 5.25	27.43 x 36.57	2.95 x 3.94	27.55 x 36.74	2.20 x 2.94	18.46 x 24.62	1.48 x 1.97	12.31 x 16.41	0.98 x 1.31	9.23 x 12.31	0.74 x 0.98
		2/3"	-- x --	-- x --	12.00 x 16.00	4.06 x 5.42	24.63 x 32.84	3.03 x 4.04	25.38 x 33.85	2.03 x 2.71	16.92 x 22.56	1.35 x 1.81	12.69 x 16.92	1.02 x 1.35
		1"	-- x --	-- x --	-- x --	-- x --	10.23 x 13.65	4.41 x 5.88	27.43 x 36.57	2.95 x 3.94	24.62 x 32.82	1.97 x 2.63	18.46 x 24.62	1.48 x 1.97
		NA	0.014	0.075	0.014	0.075	0.014	0.075	0.014	0.075	0.014	0.075	0.014	0.075
		LP/mm	42	225	42	225	42	225	42	225	42	225	42	225
		Mag	0.15	1.8	0.20	2.4	0.26	3.3	0.39	4.9	0.59	7.3	0.78	9.8
1.5X Aux Lens 29-20-40-000 WD: 52 mm	FOV Cam Format	DOF	2.89	0.10	2.89	0.10	2.89	0.10	2.89	0.10	2.89	0.10	2.89	0.10
		1/4"	18.87 x 25.16	1.51 x 2.01	14.15 x 18.87	1.13 x 1.51	10.56 x 14.08	0.85 x 1.13	7.08 x 9.44	0.57 x 0.75	4.72 x 6.29	0.38 x 0.50	3.54 x 4.72	0.28 x 0.38
		1/3"	18.29 x 24.38	1.97 x 2.63	18.46 x 24.62	1.48 x 1.97	13.78 x 18.37	1.10 x 1.47	9.23 x 12.31	0.74 x 0.98	6.15 x 8.21	0.49 x 0.66	4.62 x 6.15	0.37 x 0.49
		1/2"	8.53 x 11.38	2.63 x 3.50	18.29 x 24.38	1.97 x 2.63	18.37 x 24.49	1.47 x 1.96	12.31 x 16.41	0.98 x 1.31	8.21 x 10.94	0.66 x 0.88	6.15 x 8.21	0.49 x 0.66
		2/3"	-- x --	-- x --	8.00 x 10.67	2.71 x 3.61	16.42 x 21.89	2.02 x 2.69	16.92 x 22.56	1.35 x 1.81	11.28 x 15.04	0.90 x 1.20	8.46 x 11.28	0.68 x 0.90
		1"	-- x --	-- x --	-- x --	-- x --	6.82 x 9.10	2.94 x 3.92	18.29 x 24.38	1.97 x 2.63	16.41 x 21.88	1.31 x 1.75	12.31 x 16.41	0.98 x 1.31
2.0X Aux Lens 29-20-41-000 WD: 32 mm	FOV Cam Format	NA	0.019	0.10	0.019	0.10	0.019	0.10	0.019	0.10	0.019	0.10	0.019	0.10
		LP/mm	57	300	57	300	57	300	57	300	57	300	57	300
		Mag	0.20	2.4	0.26	3.3	0.35	4.4	0.52	6.5	0.78	9.8	1.0	13.0
		DOF	1.57	0.057	1.57	0.057	1.57	0.057	1.57	0.057	1.57	0.057	1.57	0.057
		1/4"	14.15 x 18.87	1.13 x 1.51	10.62 x 14.15	0.85 x 1.13	7.92 x 10.56	0.63 x 0.85	5.31 x 7.08	0.42 x 0.57	3.54 x 4.72	0.28 x 0.38	2.65 x 3.54	0.21 x 0.28
		1/3"	13.71 x 18.29	1.48 x 1.97	13.85 x 18.46	1.11 x 1.48	10.33 x 13.78	0.83 x 1.10	6.92 x 9.23	0.55 x 0.74	4.62 x 6.15	0.37 x 0.49	3.46 x 4.62	0.28 x 0.37
1.5X Aux Lens 29-20-40-000 WD: 52 mm	FOV Cam Format	1/2"	6.40 x 8.53	1.97 x 2.63	13.71 x 18.29	1.48 x 1.97	13.78 x 18.37	1.10 x 1.47	9.23 x 12.31	0.74 x 0.98	6.15 x 8.21	0.49 x 0.66	4.62 x 6.15	0.37 x 0.49
		2/3"	-- x --	-- x --	6.00 x 8.00	2.03 x 2.71	12.31 x 16.42	1.52 x 2.02	12.69 x 16.92	1.02 x 1.35	8.46 x 11.28	0.68 x 0.90	6.35 x 8.46	0.51 x 0.68
		1"	-- x --	-- x --	-- x --	-- x --	5.12 x 6.82	2.20 x 2.94	13.71 x 18.29	1.48 x 1.97	12.31 x 16.41	0.98 x 1.31	9.23 x 12.31	0.74 x 0.98
		NA	0.029	0.15	0.029	0.15	0.029	0.15	0.029	0.15	0.029	0.15	0.029	0.15
		LP/mm	87	450	87	450	87	450	87	450	87	450	87	450
		Mag	0.29	3.7	0.39	4.9	0.52	6.5	0.78	9.8	1.17	14.6	1.6	19.5
2.0X Aux Lens 29-20-41-000 WD: 32 mm	FOV Cam Format	DOF	0.67	0.025	0.67	0.025	0.67	0.025	0.67	0.025	0.67	0.025	0.67	0.025
		1/4"	9.44 x 12.58	0.75 x 1.01	7.08 x 9.44	0.57 x 0.75	5.28 x 7.04	0.42 x 0.56	3.54 x 4.72	0.28 x 0.38	2.36 x 3.15	0.19 x 0.25	1.77 x 2.36	0.14 x 0.19
		1/3"	9.14 x 12.19	0.98 x 1.31	9.23 x 12.31	0.74 x 0.98	6.89 x 9.18	0.55 x 0.73	4.62 x 6.15	0.37 x 0.49	3.08 x 4.10	0.25 x 0.33	2.31 x 3.08	0.18 x 0.25
		1/2"	4.27 x 5.69	1.31 x 1.75	9.14 x 12.19	0.98 x 1.31	9.18 x 12.25	0.73 x 0.98	6.15 x 8.21	0.49 x 0.66	4.10 x 5.47	0.33 x 0.44	3.08 x 4.10	0.25 x 0.33
		2/3"	-- x --	-- x --	4.00 x 5.33	1.35 x 1.81	8.21 x 10.95	1.01 x 1.35	8.46 x 11.28	0.68 x 0.90	5.64 x 7.52	0.45 x 0.60	4.23 x 5.64	0.34 x 0.45
		1"	-- x --	-- x --	-- x --	-- x --	3.41 x 4.55	1.47 x 1.96	9.14 x 12.19	0.98 x 1.31	8.21 x 10.94	0.66 x 0.88	6.15 x 8.21	0.49 x 0.66
2.0X Aux Lens 29-20-41-000 WD: 32 mm	FOV Cam Format	NA	0.038	0.20	0.038	0.20	0.038	0.20	0.038	0.20	0.038	0.20	0.038	0.20
		LP/mm	114	600	114	600	114	600	114	600	114	600	114	600
		Mag	0.39	4.9	0.52	6.5	0.70	8.7	1.0	13.0	1.6	19.5	2.1	26.0
		DOF	0.39	0.014	0.39	0.014	0.39	0.014	0.39	0.014	0.39	0.014	0.39	0.014
		1/4"	7.08 x 9.44	0.57 x 0.75	5.31 x 7.08	0.42 x 0.57	3.96 x 5.28	0.32 x 0.42	2.65 x 3.54	0.21 x 0.28	1.77 x 2.36	0.14 x 0.19	1.33 x 1.77	0.11 x 0.14
		1/3"	6.86 x 9.14	0.74 x 0.98	6.92 x 9.23	0.55 x 0.74	5.17 x 6.89	0.41 x 0.55	3.46 x 4.62	0.28 x 0.37	2.31 x 3.08	0.18 x 0.25	1.73 x 2.31	0.14 x 0.18
2.0X Aux Lens 29-20-41-000 WD: 32 mm	FOV Cam Format	1/2"	3.20 x 4.27	0.98 x 1.31	6.86 x 9.14	0.74 x 0.98	6.89 x 9.18	0.55 x 0.73	4.62 x 6.15	0.37 x 0.49	3.08 x 4.10	0.25 x 0.33	2.31 x 3.08	0.18 x 0.25
		2/3"	-- x --	-- x --	3.00 x 4.00	1.02 x 1.35	6.16 x 8.21	0.76 x 1.01	6.35 x 8.46	0.51 x 0.68	4.23 x 5.64	0.34 x 0.45	3.17 x 4.23	0.25 x 0.34
		1"	-- x --	-- x --	-- x --	-- x --	2.56 x 3.41	1.10 x 1.47	6.86 x 9.14	0.74 x 0.98	6.15 x 8.21	0.49 x 0.66	4.62 x 6.15	0.37 x 0.49

-- Limited vignetting at low magnifications

-- Configuration not recommended



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ISO 9001:2000

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