

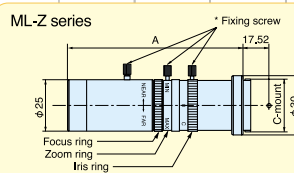
Macro Zoom Lenses



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TV macro zoom lens

CCTV simplified zoom models. Various types of images can be taken because the products are small, light weight, and very functional.



* Fix the fixing screws after setting conditions.
Do not rotate the ring while holding the screw.

Features

- Zoom ratio of 4:1. (0.02X to 2.4X)
Eight models are available.
- Iris, focus, and zoom are adjustable.
- Include screws to lock movable parts.
- Maximum outside diameter: 25mm

Product name	A dimensions (mm)
ML-Z002	80.4 to 90.83
ML-Z004	87.15 to 97.8
ML-Z007	80.7 to 87.25
ML-Z014	87.45 to 94.15
ML-Z020	88.82 to 99.34
ML-Z026	89.12 to 95.69
ML-Z040	95.7 to 106.2
ML-Z052	96.0 to 102.57

TV macro zoom lens series

Item/model	ML-Z002		ML-Z004		ML-Z007		ML-Z014	
WD (mm)	Max750 to 300 Min		Max750 to 300 Min		Max210 to 150 Min		Max210 to 150 Min	
Magnification	x 0.02 to x 0.08	x 0.06 to x 0.22	x 0.043 to x 0.16	x 0.12 to x 0.43	x 0.07 to x 0.27	x 0.11 to x 0.4	x 0.14 to x 0.51	x 0.21 to x 0.78
Depth of field (mm)	± 387 to ± 30	± 51 to ± 3.9	± 202 to ± 15	± 28 to ± 2.1	± 37 to ± 2.7	± 16 to ± 1.2	± 19 to ± 1.5	± 8.3 to ± 0.6
Effective FNO	4.6 to 22		9.2 to 44		4.6 to 22		9.2 to 44	
Weight (g)	94		101		94		102	

Item/model	ML-Z020		ML-Z026		ML-Z040		ML-Z052	
WD (mm)	Max69 to 55 Min		Max49 to 44 Min		Max69 to 55 Min		Max49 to 44 Min	
Magnification	x 0.21 to x 0.78	x 0.3 to x 1.1	x 0.27 to x 0.98	x 0.33 to x 1.21	x 0.42 to x 1.52	x 0.58 to x 2.13	x 0.54 to x 1.94	x 0.66 to x 2.37
Depth of field (mm)	± 4.2 to ± 0.3	± 2.1 to ± 0.17	± 2.7 to ± 0.2	± 1.8 to ± 0.13	± 2.2 to ± 0.17	± 1.1 to ± 0.08	± 1.3 to ± 0.1	± 1.2 to ± 0.07
Effective FNO	4.6 to 22		4.6 to 22		9.2 to 44		9.2 to 44	
Weight (g)	103		103		110		111	

High-resolution macro zoom lens

ML-Z0108

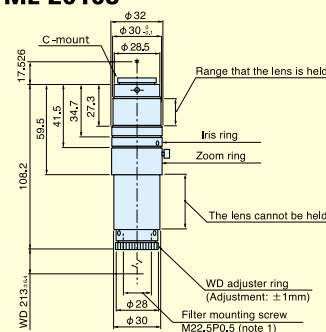
High-resolution macro lens with 8:1 magnification ratio and long working distance. By using the focus ring on the tip, working distance can be changed within a range of 20mm.

Features

- Zoom ratio of 8:1. Magnification range: 0.1X to 0.8X
 - WD=213mm
 - Focus adjustment ± 20mm (magnification variation ± 13%)
 - Iris, focus, and zoom are adjustable.
- Comes with locking screws.



ML-Z0108



Item/model	ML-Z0108		
Optical magnification	0.1X to 0.8X (zoom ratio of 8:1)		
WD	213mm		
Focus adjustment	± 20mm (amount the lens comes out ± 1mm, magnification variation ± 13%)		
	at 0.1X	at 0.4X	at 0.8X
Effective FNO	8.2	8.2	9.3
Depth of field	32.8mm	2.1mm	0.6mm
Resolution	55μm	14μm	8μm
TV distortion	-0.02% or less	+0.18% or less	+0.17% or less
Operation method	Manual: Adjusting iris, zoom, and focus		
Weight	About 140g		
Largest compatible camera	1/2"		
Mount	C-mount		

* Depth of field is calculated assuming a horizontal 320 TV resolution using a 1/2" CCD camera. (Permissible circle of confusion on the image-formation side: 40μm)

* Effective FNO indicates a value when the iris is open.

10X zoom

MLH-10X

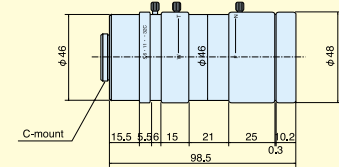


A wide range zoom lens developed for wide field. Zoom ratio can be 10:1 at a working distance of 150mm to 450mm by adjusting the focus. This lens can be used for FA, laboratory work, weak eyesight correction, and environment-related projects.

Features

- Zoom ratio of 10:1. (Magnification range: Min. 0.023X to Max. 0.84X)
- WD=Min. 450mm to Max. 150mm
- Iris, focus, and zoom are adjustable. Comes with locking screws.

MLH-10X



Field of view chart

WD	Magnification	Field of view	
		1/2" (length mm x width mm)	1/3" (length mm x width mm)
150mm	x 0.086 to x 0.84	55.8 x 74.4 to 5.7 x 7.6	42 x 56 to 4.3 x 5.7
200mm	x 0.06 to x 0.58	80 x 107 to 8.3 x 11.0	60 x 80 to 6.2 x 8.3
250mm	x 0.045 to x 0.44	107 x 142 to 10.9 x 14.5	80 x 107 to 8.2 x 10.9
300mm	x 0.037 to x 0.36	130 x 173 to 13.3 x 17.8	97 x 130 to 10.0 x 13.3
350mm	x 0.031 to x 0.3	155 x 206 to 16.0 x 21.3	116 x 155 to 12.0 x 16.0
400mm	x 0.026 to x 0.25	185 x 246 to 19.2 x 25.6	138 x 185 to 14.4 x 19.2
450mm	x 0.023 to x 0.22	209 x 278 to 21.8 x 29.1	157 x 209 to 16.4 x 21.8

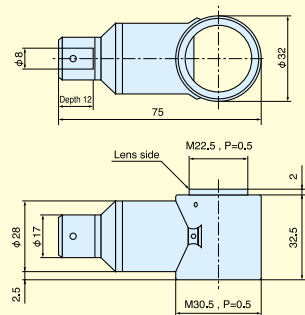
Item/model	MLH-10X
Max. magnification	0.084 x to 0.84 x
WD (mm)	150mm to 450mm
Iris	F5.6 to Close
Compatible camera mount	C-mount
Compatible camera size	1/2", 1/3", 1/4"
Filter size	M46 P=0.75
Weight	233g

Simulated coaxial episcopic illumination unit

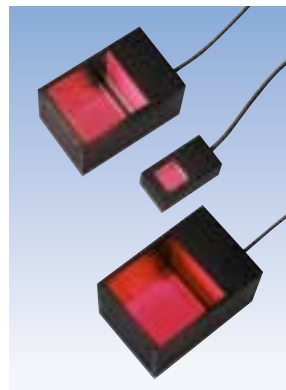
Coaxial episcopic illumination unit appearance



MLZ-HM (For ML-Z040, ML-Z052)



For detailed information about simulated coaxial LED, see P.57.



Macro zoom field of view chart

Optical magnification	2/3" (length x width x angle)	Monitor magnification		1/2" (length x width x angle)	Monitor magnification		1/3" (length x width x angle)	Monitor magnification	
		9"	14"		9"	14"		9"	14"
x 0.1	66 x 88 x 110	2.1	3.2	48 x 64 x 80	2.9	4.5	36 x 48 x 60	3.8	5.9
x 0.14	47 x 63 x 79	2.9	4.5	34 x 46 x 57	4.0	6.2	26 x 34 x 43	5.3	8.3
x 0.16	41 x 55 x 69	3.4	5.2	30 x 40 x 50	4.6	7.1	23 x 30 x 38	6.1	9.5
x 0.18	37 x 49 x 61	3.8	5.8	27 x 36 x 44	5.1	8.0	20 x 27 x 33	6.9	10.7
x 0.2	33 x 44 x 55	4.2	6.5	24 x 32 x 40	5.7	8.9	18 x 24 x 30	7.6	11.9
x 0.3	32 x 29 x 37	6.3	9.7	16 x 21 x 27	8.6	13.4	12 x 16 x 20	11.4	17.8
x 0.4	17 x 22 x 28	8.4	12.9	12 x 16 x 20	11.4	17.8	9 x 12 x 15	15.2	23.7
x 0.5	13 x 18 x 22	10.5	16.2	10 x 13 x 16	14.3	22.3	7 x 10 x 12	19.1	29.7
x 0.6	11 x 15 x 18	12.6	19.4	8 x 11 x 13	17.2	26.7	6 x 8 x 10	22.9	35.6
x 0.7	9.4 x 13 x 16	14.7	22.6	6.9 x 9.1 x 11.4	20.0	31.2	5.1 x 6.9 x 8.6	26.7	41.5
x 0.75	8.8 x 12 x 15	15.8	24.2	6.4 x 8.5 x 10.7	21.5	33.4	4.8 x 6.4 x 8.0	28.6	44.5
x 0.8	8.3 x 11 x 14	16.8	25.8	6.0 x 8.0 x 10	22.9	35.6	4.5 x 6.0 x 7.5	30.5	47.4
x 0.9	7.3 x 9.8 x 12.2	18.9	29.1	5.3 x 7.1 x 8.9	25.7	40.1	4.0 x 5.3 x 6.7	34.3	53.4
x 1	6.6 x 8.8 x 11	21.0	32.3	4.8 x 6.4 x 8.0	28.6	44.5	3.6 x 4.8 x 6.0	38.1	59.3
x 1.5	4.4 x 5.9 x 7.3	31.5	48.5	3.2 x 4.3 x 5.3	42.9	66.8	2.4 x 3.2 x 4.0	57.2	89.0
x 2	3.3 x 4.4 x 5.5	42.0	64.6	2.4 x 3.2 x 4.0	57.2	89.0	1.8 x 2.4 x 3.0	76.2	119
x 2.5	2.6 x 3.5 x 4.4	52.5	80.8	1.9 x 2.6 x 3.2	71.5	111	1.4 x 1.9 x 2.4	95.3	148