

Part number	Mag. x	Detector type					Optical specifications							Dimensions			Related		
		1/3" w x h 4.8 x 3.6 mm x mm	1/2.5" w x h 5.70 x 4.28 mm x mm	1/2 w x h 6.4 x 4.8 mm x mm	1/1.8" w x h 7.13 x 5.37 mm x mm	2/3" w x h 8.45 x 7.07 mm x mm	WD	F/N	Telecentricity typical (max)	Distorsion typical (max)	Field depth	Image res.	Object res.	Mount	Length	Diam.	Collimated illuminator	Clamping mechanic	Ring light illuminator
		Object field of view 8					1	2	3	4	5	6							
TC 23 004	2.000	2.4 x 1.8	2.9 x 2.1	3.2 x 2.4	3.6 x 2.7	4.2 x 3.5	57.1	11	< 0.08 (0.10)	< 0.04 (0.08)	0.23	7	3.5	C	101.4	28	LTCL 023-G	CMHO 023	LTRN 023 NW
TC 23 007	1.333	3.6 x 2.7	4.3 x 3.2	4.8 x 3.6	5.3 x 4.0	6.3 x 5.3	61.2	11	< 0.08 (0.10)	< 0.03 (0.08)	0.5	7	5	C	78.5	28	LTCL 023-G	CMHO 023	LTRN 023 NW
TC 23 009	1.000	4.8 x 3.6	5.7 x 4.3	6.4 x 4.8	7.1 x 5.4	8.5 x 7.1	63.3	11	< 0.08 (0.10)	< 0.04 (0.08)	0.9	7	7	C	65.0	28	LTCL 023-G	CMHO 023	LTRN 023 NW
TC 23 012	0.735	6.5 x 4.9	7.8 x 5.8	8.7 x 6.5	9.7 x 7.3	11.5 x 9.6	53.9	11	< 0.04 (0.10)	< 0.04 (0.10)	1.2	7	10	C	60.3	28	LTCL 023-G	CMHO 023	LTRN 023 NW
TC 12 016	0.385	12.5 x 9.4	14.8 x 11.1	16.6 x 12.5	18.5 x 14.0	Ø = 18.4	45.3	8	< 0.04 (0.10)	< 0.04 (0.08)	5	5	13	C	93.0	37.7	LTCL 016-G	CMHO 016	LTRN 016 NW
TC 23 016	0.528	9.1 x 6.8	10.8 x 8.1	12.1 x 9.1	13.5 x 10.2	16.0 x 13.4	45.3	8	< 0.06 (0.10)	< 0.04 (0.07)	2	5	9	C	112.7	37.7	LTCL 016-G	CMHO 016	LTRN 016 NW
TC 12 024	0.255	18.8 x 14.1	22.4 x 16.8	25.1 x 18.8	28.0 x 21.1	Ø = 27.7	69.2	8	< 0.08 (0.10)	< 0.04 (0.08)	10	5	20	C	117.8	44	LTCL 024-G	CMHO 024	LTRN 024 NW
TC 23 024	0.350	13.7 x 10.3	16.3 x 12.2	18.3 x 13.7	20.4 x 15.3	24.1 x 20.2	69.2	8	< 0.08 (0.10)	< 0.04 (0.10)	5	5	14	C	137.5	44	LTCL 024-G	CMHO 024	LTRN 024 NW
TC 13 036	0.133	36.0 x 27.0	Ø = 32.2	Ø = 36.0	Ø = 40.2	n.a.	103.5	8	< 0.04 (0.08)	< 0.03 (0.08)	38	5	38	C	133.0	61	LTCL 036-G	CMHO 036	LTRN 036 NW
TC 12 036	0.177	27.1 x 20.3	32.2 x 24.2	36.1 x 27.1	40.2 x 30.3	Ø = 39.9	103.5	8	< 0.03 (0.08)	< 0.04 (0.10)	21	5	28	C	145.0	61	LTCL 036-G	CMHO 036	LTRN 036 NW
TC 23 036	0.243	19.7 x 14.8	23.5 x 17.6	26.3 x 19.7	29.3 x 22.1	34.8 x 29.1	103.5	8	< 0.04 (0.08)	< 0.04 (0.10)	11	5	21	C	164.9	61	LTCL 036-G	CMHO 036	LTRN 036 NW
TC 13 048	0.098	48.8 x 36.6	Ø = 43.5	Ø = 48.8	Ø = 54.6	n.a.	134.6	8	< 0.08 (0.10)	< 0.06 (0.10)	65	5	51	C	167.9	75	LTCL 048-G	CMHO 048	LTRN 048 NW
TC 12 048	0.134	35.9 x 26.9	42.5 x 31.9	47.8 x 35.9	53.3 x 40.1	Ø = 52.8	134.6	8	< 0.07 (0.10)	< 0.06 (0.10)	37	5	37	C	181.5	75	LTCL 048-G	CMHO 048	LTRN 048 NW
TC 23 048	0.184	26.1 x 19.6	31.0 x 23.3	34.8 x 26.1	38.8 x 29.2	45.9 x 38.4	134.6	8	< 0.08 (0.10)	< 0.05 (0.10)	20	5	27	C	201.0	75	LTCL 048-G	CMHO 048	LTRN 048 NW
TC 12 056	0.114	42.0 x 31.5	50.0 x 37.5	56.0 x 42.0	62.4 x 47.0	Ø = 62.0	159.3	8	< 0.04 (0.08)	< 0.04 (0.08)	51	5	44	C	205.0	80	LTCL 056-G	CMHO 056	LTRN 056 NW
TC 23 056	0.157	30.6 x 22.9	36.3 x 27.3	40.7 x 30.6	45.4 x 34.2	53.8 x 45.0	159.3	8	< 0.05 (0.08)	< 0.03 (0.08)	27	5	32	C	225.0	80	LTCL 056-G	CMHO 056	LTRN 056 NW
TC 13 064	0.074	65.2 x 48.9	Ø = 57.8	Ø = 65.2	Ø = 72.9	n.a.	182.3	8	< 0.06 (0.08)	< 0.03 (0.07)	124	5	68	C	212.0	100	LTCL 064-G	CMHO 064	LTRN 064 NW
TC 12 064	0.100	48.0 x 36.0	57.0 x 42.8	64.0 x 48.0	71.3 x 53.7	Ø = 70.7	182.3	8	< 0.05 (0.08)	< 0.04 (0.07)	67	5	50	C	225.9	100	LTCL 064-G	CMHO 064	LTRN 064 NW
TC 23 064	0.138	34.9 x 26.2	41.3 x 31.0	46.5 x 34.9	51.8 x 39.0	61.2 x 51.2	182.3	8	< 0.05 (0.08)	< 0.03 (0.07)	35	5	36	C	245.5	100	LTCL 064-G	CMHO 064	LTRN 064 NW
TC 23 072	0.122	39.2 x 29.4	46.7 x 35.1	52.3 x 39.2	58.3 x 43.9	69.3 x 58.0	227.7	8	< 0.04 (0.08)	< 0.03 (0.07)	45	5	41	C	299.2	116	LTCL 080-G	CMHO 080	LTRN 080 NW
TC 13 080	0.059	81.2 x 60.9	Ø = 72.5	Ø = 81.2	Ø = 90.9	n.a.	227.7	8	< 0.05 (0.08)	< 0.03 (0.08)	192	5	85	C	258.0	116	LTCL 080-G	CMHO 080	LTRN 080 NW
TC 12 080	0.080	59.8 x 44.8	71.3 x 53.5	79.7 x 59.8	88.8 x 66.8	Ø = 88.4	227.7	8	< 0.03 (0.08)	< 0.04 (0.10)	104	5	63	C	271.6	116	LTCL 080-G	CMHO 080	LTRN 080 NW
TC 23 080	0.110	43.5 x 32.6	51.8 x 38.9	58.0 x 43.5	64.6 x 48.7	76.8 x 64.3	227.7	8	< 0.04 (0.08)	< 0.02 (0.10)	55	5	45	C	291.2	116	LTCL 080-G	CMHO 080	LTRN 080 NW
TC 23 085	0.104	46.3 x 34.7	54.8 x 41.2	61.8 x 46.3	68.8 x 51.8	81.3 x 68.0	280.6	8	< 0.04 (0.08)	< 0.02 (0.08)	62	5	48	C	344.5	143	LTCL 096-G	CMHO 096	LTRN 096 NW
TC 13 096	0.050	96.0 x 72.0	Ø = 85.6	Ø = 96.0	Ø = 107.4	n.a.	280.6	8	< 0.06 (0.08)	< 0.04 (0.10)	268	5	100	C	303.0	143	LTCL 096-G	CMHO 096	LTRN 096 NW
TC 12 096	0.068	70.6 x 52.9	83.8 x 62.9	94.1 x 70.6	104.8 x 78.9	Ø = 104.0	279.6	8	< 0.06 (0.08)	< 0.03 (0.08)	145	5	74	C	317.0	143	LTCL 096-G	CMHO 096	LTRN 096 NW
TC 23 096	0.093	51.4 x 38.5	61.3 x 46.0	68.5 x 51.4	76.3 x 57.5	90.9 x 76.0	279.6	8	< 0.06 (0.08)	< 0.04 (0.08)	77	5	54	C	336.5	143	LTCL 096-G	CMHO 096	LTRN 096 NW
TC 23 110	0.079	60.5 x 45.3	72.2 x 54.2	80.6 x 60.5	89.8 x 67.6	107.0 x 89.5	336.5	8	< 0.06 (0.08)	< 0.03 (0.07)	106	5	63	C	430.3	180	LTCL 120-G	CMHO 120	LTRN 120NW
TC 12 120	0.052	92.1 x 69.1	109.6 x 82.3	122.8 x 92.1	136.7 x 103.0	Ø = 136.0	336.5	8	< 0.06 (0.08)	< 0.04 (0.10)	247	5	96	C	402.7	180	LTCL 120-G	CMHO 120	LTRN 120NW
TC 23 120	0.072	67.0 x 50.3	79.2 x 59.4	89.4 x 67.0	99.5 x 75.0	117.4 x 98.2	336.5	8	< 0.07 (0.08)	< 0.04 (0.10)	131	5	69	C	422.4	180	LTCL 120-G	CMHO 120	LTRN 120NW
TC 23 130	0.068	70.9 x 53.2	83.8 x 62.9	94.5 x 70.9	105.3 x 79.3	124.3 x 104.0	398	8	< 0.05 (0.08)	< 0.04 (0.10)	146	5	74	C	490.0	200	LTCL 144-G	CMHO 144	LTRN 144 NW
TC 12 144	0.044	107.9 x 81.0	129.5 x 97.3	143.9 x 107.9	160.3 x 120.7	Ø = 160.7	398	8	< 0.05 (0.08)	< 0.05 (0.08)	339	5	114	C	462.1	200	LTCL 144-G	CMHO 144	LTRN 144 NW
TC 23 144	0.061	78.6 x 58.9	93.4 x 70.2	104.8 x 78.6	116.7 x 87.9	138.5 x 115.9	398	8	< 0.05 (0.08)	< 0.04 (0.08)	180	5	82	C	481.9	200	LTCL 144-G	CMHO 144	LTRN 144 NW
TC 23 172	0.051	94.6 x 70.9	111.8 x 83.9	126.1 x 94.6	140.5 x 105.8	165.7 x 138.6	531	8	< 0.05 (0.08)	< 0.04 (0.10)	260	5	98	C	630.3	260	LTCL 192-G		
TC 12 192	0.033	144.1 x 108.0	172.7 x 129.7	192.1 x 144.1	213.9 x 161.1	Ø = 214.2	531	8	< 0.06 (0.08)	< 0.04 (0.08)	603	5	152	C	602.6	260	LTCL 192-G		
TC 23 192	0.046	104.9 x 78.7	123.9 x 93.0	139.8 x 104.9	155.7 x 117.3	183.7 x 153.7	531	8	< 0.06 (0.08)	< 0.05 (0.08)	320	5	109	C	622.3	260	LTCL 192-G		
TC 23 200	0.044	110.0 x 82.5	129.5 x 97.3	146.7 x 110.0	163.3 x 123.0	192.0 x 160.7	500	8	< 0.06 (0.08)	< 0.05 (0.10)	352	5	114	C	792.0	322	LTCL 240-G		
TC 23 240	0.037	130.8 x 98.1	154.1 x 115.7	174.4 x 130.8	194.3 x 146.3	228.4 x 191.1	500	8	< 0.03 (0.08)	< 0.04 (0.08)	498	5	135	C	775.1	322	LTCL 240-G		

1. Working Distance: distance between the front lens and the object. Set this distance within +/- 3% of the nominal value for maximum resolution and minimum distortion

2. Working F-number: the real F-number of a lens when used as a macro. Lenses with smaller apertures can be supplied on request

3. Maximum slope of principal rays inside the lens: when converted to millirad, it gives the maximum measurement error for any millimeter of object displacement. Typical (average production) values and maximum (guaranteed) values are listed.

4. Percent deviation of the real image compared to an ideal, undistorted image: typical (average production) and maximum (guaranteed) values are listed

5. At the borders of the field depth the image can be still used for measurement but, to get a very sharp image, only half of the nominal field depth should be considered

6. Measured from the front end of the mechanics to the camera flange

7. The 1/1.8" (9 mm diagonal) FOV for TC 12 XX lenses may show some vignetting at the image corners, as the lens is optimized for 1/2" detector (8 mm diagonal)

8. For the fields with the indication "Ø =" the image of a circular object is inscribed inside the short side of the detector