Optical and mechanical dimensions Lens name	Rel. aperture / focal length [mm]	Optical design [lens elements/groups]	Effective focal length ±1% [mm]	Nodal point separation [mm]	Front-side screw-in thread for filters and other accessories	Max. diameter of the front mount [mm]	Max. diameter of the rear mount [mm]	Total overall height [mm]	Shutter diameter [mm] without cable	Flange surface to rear edge of mount [mm]	Thread of the shutter for assembling on the lens plate	Flange focal distance [mm] for the given distance or scale	Smallest diaphragm aperture	Shutter type and shutter size (different shutters on request)	Weight with shutter indicated [grams]	Order number of the lens including shutter
STANDARD LENSES				**HH'**	**Thread$_1$**	**d_1**	**d_2**	**h_1**	**d_3**	**h_2**	**Thread$_2$**	**$s'_{A\infty}$**				
Apo-Digitar	**5.6/24 XL**	8/4	24.9	12.7	[1] M 52 x 0.75 M 52 x 0.75	[2] 54.0 54.0	43.0 43.0 43.0	[2] 37.8 37.8	[2] 80.0 97.0	[2] 14.4 12.2	[2] M 32.5 x 0.5 M 39 x 0.75	[2] 26.4 24.2	16 16 16	Schneider Electr. 0 [2] Schneider Electr. 0 Rollei Electronic 0	[2] 255 380	[3] 10427 10439
Digitar	**2.8/28 L**	12/10	29.3	58.0	M 77 x 0.75	85.0	30.0	81.1	80.0 97.0	20.6 18.4	M 32.5 x 0.5 M 39 x 0.75	69.9 67.7	22 22	Schneider Electr. 0 Rollei Electronic 0	535 660	17529 27631
Apo-Digitar	**5.6/35 XL**	8/4	36.4	15.4	[1] M 52 x 0.75 M 52 x 0.75	[2] 54.0 54.0	43.0 43.0 43.0	[2] 44.0 44.0	[2] 80.0 97.0	[2] 17.4 15.2	[2] M 32.5 x 0.5 M 39 x 0.75	[2] 39.4 37.2	22 22 22	Schneider Electr. 0 [2] Schneider Electr. 0 Rollei Electronic 0	[2] 240 405	[3] 10647 10649
Apo-Digitar	**5.6/47 XL**	8/4	47.6	20.8	M 52 x 0.75	54.0	43.0	54.7	80.0 97.0	22.0 19.8	M 32.5 x 0.5 M 39 x 0.75	52.3 50.1	32 32	Schneider Electr. 0 Rollei Electronic 0	300 425	17691 27632
Apo-Digitar	**4.0/60 N**	6/4	59.9	-1.9	M 40.5 x 0.5	42.0	31.0	42.5	80.0 97.0	15.0 12.8	M 32.5 x 0.5 M 39 x 0.75	55.1 52.9	22 22	Schneider Electr. 0 Rollei Electronic 0	250 375	17721 27637
Apo-Digitar	**5.6/72 L**	6/4	74.8	-1.7	M 40.5 x 0,5	43.0	35.0	36.4	80.0 97.0	9.8 7.7	M 32.5 x 0.5 M 39 x 0.75	68.4 66.2	45 45	Schneider Electr. 0 Rollei Electronic 0	221 346	1009064 1009061
Apo-Digitar	**4.0/80 L**	6/4	80.3	-1.8	M 40.5 x 0.5	42.0	31.0	42.6	80.0 97.0	14.6 12.4	M 32.5 x 0.5 M 39 x 0.75	78.8 76.6	32 32	Schneider Electr. 0 Rollei Electronic 0	255 380	17731 27638
Apo-Digitar	**4.5/90 N**	6/4	90.7	-3.5	M 40.5 x 0.5	42.0	34.0	48.7	80.0 97.0	20.7 18.5	M 32.5 x 0.5 M 39 x 0.75	86.8 84.6	32 32	Schneider Electr. 0 Rollei Electronic 0	280 405	17780 27728
Apo-Digitar	**5.6/100 N**	6/4	101.0	-2.1	M 40.5 x 0.5	42.0	36.0	42.3	80.0 97.0	15.7 13.5	M 32.5 x 0.5 M 39 x 0.75	97.0 94.8	45 45	Schneider Electr. 0 Rollei Electronic 0	250 375	17890 27729
Apo-Digitar	**5.6/120 N**	6/4	124.9	-2.4	M 40.5 x 0.5	42.0	42.0	41.8	80.0 97.0	17.3 15.1	M 32.5 x 0.5 M 39 x 0.75	120.1 117.9	64 64	Schneider Electr. 0 Rollei Electronic 0	255 380	17900 27731
Apo-Digitar	**5.6/150 N**	6/4	151.3	-4.6	M 40.5 x 0.5	42.0	45.0	71.2	80.0 97.0	37.8 35.6	M 32.5 x 0.5 M 39 x 0.75	151.4 149.2	64 64	Schneider Electr. 0 Rollei Electronic 0	395 520	17941 27792
Apo-Digitar	**5.6/180 T**	6/4	180.1	-3.6	M 55 x 0.75	58.0	42.0	65.0	80.0 97.0	24.5 22.3	M 32.5 x 0.5 M 39 x 0.75	173.2 171.0	64 64	Schneider Electr. 0 Rollei Electronic 0	343 508	1003283 1003284
Apo-Digitar	**6.8/210 T** **5.6/210 T**	6/4 6/4	210.1 210.1	-4.2 -4.2	M 72 x 0.75 M 72 x 0.75	75.0 75.0	52.0 52.0	74.3 74.3	80.0 97.0	29.0 27.4	M 32.5 x 0.5 M 39 x 0.75	202.6 201.0	64 64	Schneider Electr. 0 Rollei Electronic 1	420 590	1005762 1005761
MACRO LENSES				**HH'**	**Thread$_1$**	**d_1**	**d_2**	**h_1**	**d_3**	**h_2**	**Thread$_2$**	**$s'_{A1:1}$**				
Apo-Digitar	**5.6/80 M**	6/4	81.5	-1.0	M 40.5 x 0.5	42.0	31.0	47.9	80.0 97.0	19.9 17.7	M 32.5 x 0.5 M 39 x 0.75	159.7 157.5	32 32	Schneider Electr. 0 Rollei Electronic 0	275 400	17942 27639
Apo-Digitar	**5.6/120 M**	8/4	120.2	-1.2	M 40.5 x 0.5	42.0	37.5	55.1	80.0 97.0	23.2 21.0	M 32.5 x 0.5 M 39 x 0.75	236.1 233.9	45 45	Schneider Electr. 0 Rollei Electronic 0	300 425	17964 27732

Centerfilters for Digitar lenses Lens name	Rel. aperture / focal length [mm]	Centerfilter identification	Exposure correction as filter factor / in f-stops	Centerfilter thread (to be mounted at lens)	Front-side screw-in thread (for an additional liter)	Order number of the centerfilter
Apo-Digitar	**5.6/24 XL**	IId	4x / 2	M 52 x 0.75	M 72 x 0.75	19786
For thread in lens plate *		IIb	4x / 2	M 67 x 0.75	M 72 x 0.75	24061
Apo-Digitar	**5.6/35 XL**	IIf	4x / 2	M 52 x 0.75	M 72 x 0.75	1003286
For thread in lens plate *		IIg	4x / 2	M 67 x 0.75	M 72 x 0.75	1003287
Apo-Digitar	**5.6/47 XL**	II	3x / 1.5	M 52 x 0.75	M 67 x 0.75	16190

* For application acc. footnotes [2]) and [3]) on the right and illustration on page 10, top left

Footnotes:

[1]) M 67 x 0.75 in the lens plate and M 52 x 0.75 in the lens

[2]) These measurements do not apply for versions where the Schneider Electronic Shutters are part of a special lens plate and both come as a unit (see illustration on page 10, top left).

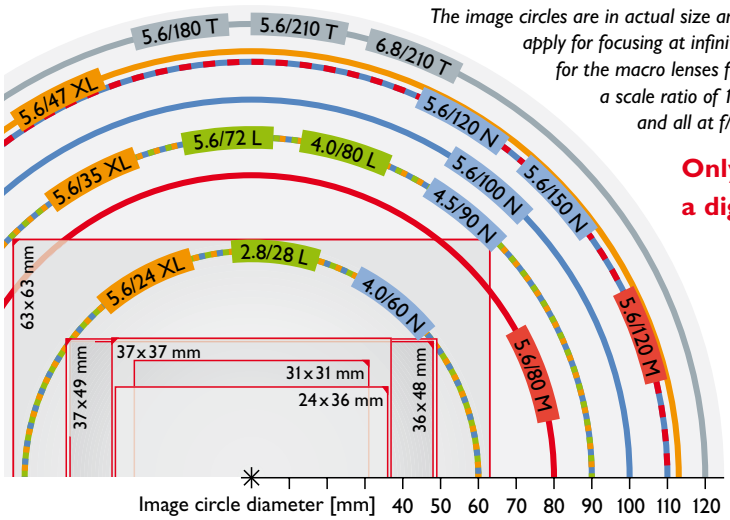
[3]) Order number for this version:

5.6/24 XL	**5.6/35 XL**	for camera system
10920	1003311	Arca Swiss 110x110 mm
11419	1003313	Cambo
11394	1003312	Horseman
10470	1003309	Linhof M 679 / M 679 cc / M 679 cs
10453	1003308	Plaubel PL69D
10602	1003310	Sinar P2
1015767	1015768	Sinar P3

NOTE: With the **Gaussoptic** program for Windows 3.xx/NT, versatile optical imaging calculations are possible. It contains all necessary Gauss lens data of the complete series of lenses for analog and digital photography that we supply.

The program **Gaussoptic** can be purchased directly from us under Order No. 43590 (our address can be found on the last page).

Angle of view, image circles, range of lens displacements Lens name	Rel. aperture / focal length [mm]	Recommended centerfilter type	Recommended aperture range	Angle of view at full aperture [degrees]	Image circle diameter [mm] at full aperture	Angle of view at f/11 [degrees]	Image circle diameter [mm] at f/11	Maximum lens displacements at f/11 and landscape format (for portrait format swap the data) focusing at infinity (standard lenses) or at scale 1:1 (macro lenses)											
								vertical [mm]	horizontal [mm]	vertical [mm]	horizontal [mm]	vertical [mm]	horizontal [mm]	vertical [mm]	horizontal [mm]	vertical [mm]	horizontal [mm]	vertical [mm]	horizontal [mm]
STANDARD LENSES								**24 x 36 mm**		**31 x 31 mm**		**37 x 37 mm**		**36 x 48 mm**		**37 x 49 mm**		**63 x 63 mm**	
Apo-Digitar	**5.6/24 XL**	IId	5.6 - 11	100°	60	100°	60	↑ 12	→ 9.5	↑ 10	→ 10	↑ 5.1	→ 5.1	↑ 0	→ 0				
Digitar	**2.8/28 L**		2.8 - 11	92°	60	92°	60	↑ 12	→ 9.5	↑ 10	→ 10	↑ 5.1	→ 5.1	↑ 0	→ 0				
Apo-Digitar	**5.6/35 XL**	IIf	5.6 - 11	88°	70	102°	90	↑ 29	→ 25	↑ 27	→ 27	↑ 23	→ 23	↑ 20	→ 17	↑ 19	→ 17	↑ 0.6	→ 0.6
Apo-Digitar	**5.6/47 XL**	II	8 - 11	92°	98	100°	113	↑ 42	→ 37	↑ 39	→ 39	↑ 35	→ 35	↑ 33	→ 30	↑ 32	→ 29	↑ 15	→ 15
Apo-Digitar	**4.0/60 N**		4 - 11	53°	60	53°	60	↑ 12	→ 9.5	↑ 10	→ 10	↑ 5.1	→ 5.1	↑ 0	→ 0				
Apo-Digitar	**5.6/72 L**		5.6 - 11	62°	90	62°	90	↑ 29	→ 25	↑ 27	→ 27	↑ 23	→ 23	↑ 20	→ 17	↑ 19	→ 17	↑ 0.6	→ 0.6
Apo-Digitar	**4.0/80 L**		5.6 - 11	53°	80	59°	90	↑ 29	→ 25	↑ 27	→ 27	↑ 23	→ 23	↑ 20	→ 17	↑ 19	→ 17	↑ 0.6	→ 0.6
Apo-Digitar	**4.5/90 N**		4.5 - 11	53°	90	53°	90	↑ 29	→ 25	↑ 27	→ 27	↑ 23	→ 23	↑ 20	→ 17	↑ 19	→ 17	↑ 0.6	→ 0.6
Apo-Digitar	**5.6/100 N**		5.6 - 11	53°	100	53°	100	↑ 35	→ 31	↑ 32	→ 32	↑ 28	→ 28	↑ 26	→ 23	↑ 25	→ 22	↑ 7.3	→ 7.3
Apo-Digitar	**5.6/120 N**		5.6 - 11	48°	110	48°	110	↑ 40	→ 36	↑ 37	→ 37	↑ 33	→ 33	↑ 31	→ 28	↑ 31	→ 27	↑ 14	→ 14
Apo-Digitar	**5.6/150 N**		5.6 - 11	40°	110	40°	110	↑ 40	→ 36	↑ 37	→ 37	↑ 33	→ 33	↑ 31	→ 28	↑ 31	→ 27	↑ 14	→ 14
Apo-Digitar	**5.6/180 T**		5.6 - 11	37°	120	37°	120	↑ 45	→ 41	↑ 42	→ 42	↑ 39	→ 39	↑ 37	→ 33	↑ 36	→ 33	↑ 20	→ 20
Apo-Digitar	**6.8/210 T** **5.6/210 T**		5.6 - 11	32°	120	32°	120	↑ 45	→ 41	↑ 42	→ 42	↑ 39	→ 39	↑ 37	→ 33	↑ 36	→ 33	↑ 20	→ 20
MACRO LENSES		**Scale**						**24 x 36 mm**		**31 x 31 mm**		**37 x 37 mm**		**36 x 48 mm**		**37 x 49 mm**		**63 x 63 mm**	
Apo-Digitar	**5.6/80 M**	1:4	5.6 - 11			40°	75	↑ 21	→ 18	↑ 19	→ 19	↑ 14	→ 14	↑ 11	→ 8.9	↑ 9.9	→ 8.1		
At scales exceeding 1:1 the lens should not be stopped down because of increasing diffraction		1:2	5.6 - 11			36°	80	↑ 24	→ 20	↑ 22	→ 22	↑ 17	→ 17	↑ 14	→ 12	↑ 13	→ 11		
		1:1	5.6 - 8	28°	80	28°	80	↑ 24	→ 20	↑ 22	→ 22	↑ 17	→ 17	↑ 14	→ 12	↑ 13	→ 11		
		2:1	5.6	18.6°	80			↑ 24	→ 20	↑ 22	→ 22	↑ 17	→ 17	↑ 14	→ 12	↑ 13	→ 11		
		4:1	5.6	12.6°	90			↑ 29	→ 25	↑ 27	→ 27	↑ 23	→ 23	↑ 20	→ 17	↑ 19	→ 17	↑ 0.6	→ 0.6
Apo-Digitar	**5.6/120 M**	1:4	5.6 - 11			30°	80	↑ 24	→ 20	↑ 22	→ 22	↑ 17	→ 17	↑ 14	→ 12	↑ 13	→ 11		
At scales exceeding 1:1 the lens should not be stopped down because of increasing diffraction		1:2	5.6 - 11			28°	90	↑ 29	→ 25	↑ 27	→ 27	↑ 23	→ 23	↑ 20	→ 17	↑ 19	→ 17	↑ 0.6	→ 0.6
		1:1	5.6 - 8	26°	110	26°	110	↑ 40	→ 36	↑ 37	→ 37	↑ 33	→ 33	↑ 31	→ 28	↑ 31	→ 27	↑ 14	→ 14
		2:1	5.6	17.4°	110			↑ 40	→ 36	↑ 37	→ 37	↑ 33	→ 33	↑ 31	→ 28	↑ 31	→ 27	↑ 14	→ 14
		4:1	5.6	10.5°	110			↑ 40	→ 36	↑ 37	→ 37	↑ 33	→ 33	↑ 31	→ 28	↑ 31	→ 27	↑ 14	→ 14



The image circles are in actual size and apply for focusing at infinity, for the macro lenses for a scale ratio of 1:1, and all at f/11

IMAGE CIRCLES

Only sufficient reserve displacement guarantees a digital image with a correct perspective

The comparison of the chip formats with the image circles of the Digitar series shows that these leave a lot of scope within the focal lengths typical for this format for parallel displacement in order to correct perspective (elimination of converging lines) and for lens tilt/swing for a better control of depth of field.

Optical and mechanical dimensions

Lens name	Rel. aperture / Focal length [mm]	Optical design [elements/groups]	Effective focal length ±1% [mm]	Frontal thread mount size for filters and other accessories	Max. frontal lens mount diameter [mm]	Max. rear lens mount diameter [mm]	Rear thread mount size for an additional filter	Overall length [mm]	Flange to rear edge of lens mount [mm]	Thread mount size of shutter for fixing at the lens plate	Flange focal distance [mm]	Smallest aperture	Shutter type and size	Weight of the lens including shutter [Gramm]	Order number of the lens including shutter
STANDARD				$Thread_1$	d_1	d_2	$Thread_2$	h_1	h_2	$Thread_S$	$s'_{A\infty}$				
Super-Angulon	**5.6/38 XL**	8/4	39.4	M 72 x 0.75	75.0	60.0	–	59.5	30.4	M 32.5 x 0.5	52.1	22	Copal 0	274	43260
	5.6/47 XL	8/4	48.0	M 67 x 0.75	70.0	63.5	–	60.8	30.1	M 32.5 x 0.5	59.1	32	Copal 0	310	25044
	5.6/58 XL	8/4	58.2	M 67 x 0.75	70.0	60.0	–	65.5	31.0	M 32.5 x 0.5	70.0	32	Copal 0	330	16819
	5.6/72 XL	8/4	72.0	M 95 x 1	100.0	75.0	–	81.5	35.6	M 32.5 x 0.5	82.2	45	Copal 0	520	25587
	5.6/90 XL	8/4	90.7	M 95 x 1	100.0	86.0*	–	95.9	43.6	M 32.5 x 0.5	103.5	45	Copal 0	665	16823
	6.8/90	8/4	90.6	M 82 x 0.75	90.0	80.0	–	97.7	45.4	M 32.5 x 0.5	103.4	64	Copal 0	655	28185
Super-Symmar Aspheric	**4.5/80 XL**	6/4	81.0	M 67 x 0.75	70.0	43.0	–	51.3	14.8	M 32.5 x 0.5	84.7	45	Copal 0	274	35535
	5.6/110 XL	6/4	109.9	M 67 x 0.75	70.0	54.0	M 52 x 0.75	60.0	18.9	M 39 x 0.75	117.2	45	Copal 1	425	12466
	5.6/150 XL	6/4	147.7	M 95 x 1	100.0	65.0	M 62 x 0.75	80.0	24.2	M 39 x 0.75	157.9	64	Copal 1	740	12462
	5.6/210 XL	6/4	209.2	M 135 x 1	140.0	75.0	M 72 x 0.75	120.0	35.6	M 62 x 0.75	216.3	64	Copal 3	2010	25213
Apo-Symmar	**5.6/120 L**	6/4	123.2	M 52 x 0.75	54.0	54.0	M 52 x 0.75	42.4	16.5	M 32.5 x 0.5	116.3	64	Copal 0	210	29328
	5.6/150 L	6/4	151.5	M 58 x 0.75	60.0	60.0	M 58 x 0.75	53.1	21.1	M 32.5 x 0.5	142.2	64	Copal 0	267	29416
	5.6/180 L	6/4	180.4	M 72 x 0.75	75.0	75.0	M 72 x 0.75	62.8	28.1	M 39 x 0.75	177.7	64	Copal 1	435	29420
	5.6/210 L	6/4	209.0	M 77 x 0.75	80.0	80.0	M 77 x 0.75	73.5	35.8	M 39 x 0.75	208.1	64	Copal 1	546	29423
	5.6/300 L	6/4	296.3	M 105 x 1	110.0	80.0	M 77 x 0.75	96.1	35.3	M 62 x 0.75	283.1	64	Copal 3	1150	29426
	8.4/480 L	6/4	469.4	M 105 x 1	110.0	110.0	M 105 x 1	129.4	55.7	M 62 x 0.75	454.0	64	Copal 3	1850	29428
Tele-Xenar	**5.6/250**	5/5	250.3	M 82 x 0.75	86.0	58.0	–	105.0	36.6	M 39 x 0.75	195.1	64	Copal 1	692	11383
Apo-Tele-Xenar	**5.6/400**	5/4	387.4	M 82 x 0.75	85.0	60.0	M 58 x 0.75	107.0	28.3	M 62 x 0.75	285.1	64	Copal 3	916	32676
	9/600	5/5	598.5	M 105 x 1	112.0	90.0	M 86 x 0.75	168.5	65.9	M 62 x 0.75	461.3	64	Copal 3	1940	28171
	12/800	6/5	796.6	M 105 x 1	112.0	90.0	M 86 x 0.75	169.9	67.3	M 62 x 0.75	628.2	64	Copal 3	2132	28173
MACRO				$Thread_1$	d_1	d_2	$Thread_2$	h_1	h_2	$Thread_S$	$s'_{A1:1}$				
Makro-Symmar	**5.6/80 HM**	8/4	81.5	M 40.5 x 0.5	42.0	31.5	–	47.9	19.6	M 32.5 x 0.5	159.4	32	Copal 0	200	25592
	5.6/120 HM	8/4	119.9	M 40.5 x 0.5	42.0	37.5	–	55.1	23.2	M 32.5 x 0.5	235.0	45	Copal 0	230	39900
	5.6/180 HM	8/4	179.9	M 58 x 0.75	60.0	57.0	–	80.4	35.7	M 39 x 0.75	354.3	64	Copal 1	500	39905

* Rear mount diameter without removable lens protection ring is only 78 mm (important for cameras with small lens plate, e.g. for some technical cameras with baseboard)

For explanations of abbreviations in in the header of standard and macro lenses see upper drawing left of this table

Flage focal distance s'_A is related to a scale of 1:1 for macro lenes instead of a setting at infinity as usual for standard lenses

Graphic representation of image circles for a setting at infinity (for macro lenses for a scale of 1:1) see page 22

Numerical values of angle of view, image circle diameter and range of movements related to a variety of roll film and sheet film formats see table on the next page

Angle of view, image circles, and range of lens displacements

Lens name	Rel. aperture / focal length [mm]	Recommended centerfilter type	Angle of view at full aperture [degree]	Image-circle diameter at full aperture [mm]	Angle of view at f-stop 22 [degree]	Image-circle diameter at f-stop 22 [mm]	Max. lens displacement at f-stop 22 and landscape format (for portrait format the values are to be reversed) in focus on infinity (standard lenses) or for scale 1:1 (macro lenses)									
							vertical [mm]	horizontal [mm]	vertical [mm]	horizontal [mm]	vertical [mm]	horizontal [mm]	vertical [mm]	horizontal [mm]	vertical [mm]	horizontal [mm]	vertical [mm]	horizontal [mm]
STANDARD LENSES (set on infinity)							**6 x 7 cm**		**6 x 9 cm**		**6 x 12 cm**		**4 x 5"**		**5 x 7"**		**8 x 10"**	
Super-Angulon	**5.6/38 XL**	IIa	101°	96	120°	139	↑31	→ 28	↑ 28	→ 22	↑ 7	→ 4						
	5.6/47 XL	IIIc	98°	110	120°	166	↑47	→ 42	↑ 44	→ 37	↑ 29	→ 18	↑ 9	→ 8				
	5.6/58 XL	IIIb	96°	129	110°	166	↑47	→ 42	↑ 44	→ 37	↑ 29	→ 18	↑ 9	→ 8				
	5.6/72 XL	IVb	98°	166	115°	229	↑81	→ 75	↑ 79	→ 70	↑ 70	→ 51	↑ 50	→ 44	↑ 16	→ 12		
	5.6/90 XL	IVa	96°	201	110°	259	↑96	→ 90	↑ 95	→ 85	↑ 87	→ 66	↑ 67	→ 60	↑ 37	→ 30		
	6.8/90	IIIb	92°	188	100°	216	↑74	→ 68	↑ 72	→ 63	↑ 62	→ 44	↑ 42	→ 37	↑ 6	→ 4		
Super-Symmar Aspheric	**4.5/80 XL**	IIIb	86°	150	105°	211	↑71	→ 66	↑ 69	→ 60	↑ 59	→ 42	↑ 39	→ 34	↑ 2	→ 1		
	5.6/110 XL	IIIb	80°	186	105°	288	↑111	→105	↑110	→100	↑103	→ 81	↑ 83	→ 76	↑ 56	→ 46		
	5.6/150 XL	IVa	80°	248	105°	386	↑162	→155	↑161	→150	↑155	→131	↑135	→127	↑113	→ 98	↑ 52	→ 44
	5.6/210 XL	VI	81°	357	100°	500	↑219	→212	↑219	→207	↑215	→188	↑195	→185	↑175	→158	↑121	→108
Apo-Symmar	**5.6/120 L**		62°	148	75°	189	↑59	→ 54	↑ 57	→ 49	↑ 45	→ 30	↑ 25	→ 21				
	5.6/150 L		62°	182	75°	233	↑83	→ 77	↑ 81	→ 72	↑ 72	→ 53	↑ 52	→ 46	↑ 19	→ 15		
	5.6/180 L		62°	217	75°	277	↑106	→100	↑104	→ 94	↑ 97	→ 76	↑ 77	→ 70	↑ 48	→ 40		
	5.6/210 L		62°	251	75°	321	↑128	→122	↑127	→117	↑121	→ 98	↑101	→ 93	↑ 76	→ 64	↑ 7	→ 5
	5.6/300 L		62°	356	72°	430	↑184	→177	↑183	→172	↑178	→153	↑158	→150	↑137	→121	↑ 80	→ 69
	8.4/480 L		44°	384	56°	500	↑219	→212	↑219	→207	↑215	→188	↑195	→185	↑175	→158	↑121	→108
Tele-Xenar	**5.6/250**		38°	171	42°	190	↑60	→ 55	↑ 58	→ 49	↑ 46	→ 31	↑ 26	→ 22				
Apo-Tele-Xenar	**5.6/400**		36°	250	36°	250	↑92	→ 86	↑ 90	→ 81	↑ 82	→ 62	↑ 62	→ 55	↑ 31	→ 24		
	9/600		29°	312	37°	400	↑169	→162	↑168	→157	↑163	→138	↑143	→134	↑121	→106	↑ 61	→ 52
	12/800		28°	400	34°	480	↑209	→202	↑208	→197	↑204	→178	↑184	→175	↑164	→147	↑109	→ 97
MACRO LENSES (set for scale M)		**M**					**6 x 7 cm**		**6 x 9 cm**		**6 x 12 cm**		**4 x 5"**		**5 x 7"**		**8 x 10"**	
Makro-Symmar	**5.6/80 HM**	1:2	47°	106	52°	120	↑20	→ 17	↑ 15	→ 12								
		1:1	47°	141	52°	160	↑43	→ 39	↑ 40	→ 34	↑ 25	→ 15	↑ 4	→ 4				
		2:1	47°	212	52°	239	↑85	→ 80	↑ 83	→ 75	↑ 75	→ 56	↑ 55	→ 49	↑ 23	→ 18		
	5.6/120 HM	1:2	47°	157	55°	188	↑58	→ 54	↑ 56	→ 48	↑ 44	→ 30	↑ 23	→ 20				
		1:1	47°	210	55°	251	↑92	→ 86	↑ 91	→ 81	↑ 82	→ 62	↑ 61	→ 55	↑ 30	→ 24		
		2:1	47°	313	55°	375	↑156	→149	↑155	→144	↑150	→125	↑129	→121	↑106	→ 92	↑ 44	→ 37
	5.6/180 HM	1:2	47°	234	55°	281	↑107	→102	↑106	→ 96	↑ 99	→ 78	↑ 79	→ 72	↑ 51	→ 41		
		1:1	47°	313	55°	375	↑156	→149	↑155	→144	↑150	→125	↑129	→121	↑106	→ 92	↑ 44	→ 37
		2:1	47°	468	55°	562	↑250	→244	↑250	→238	↑247	→220	↑226	→216	↑207	→189	↑155	→141