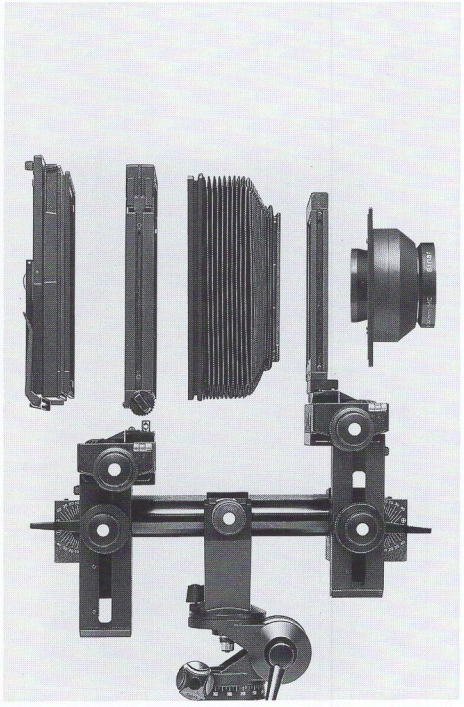
sinar®

lenses and shutters

No chain is stronger than its weakest link.

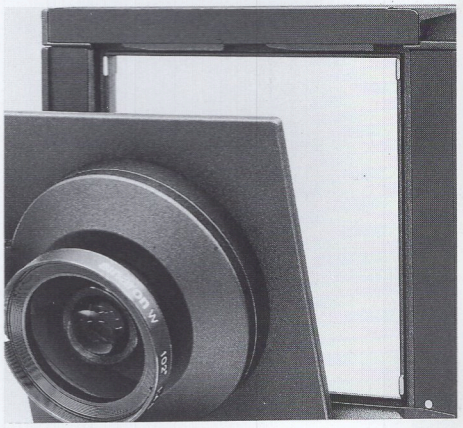


The precision and production tolerances of a lens and camera are vital to the quality of photographs taken with them. The result depends on the weakest link in this chain. That is why experts who must have the best prefer camera systems where one maker supplies matched cameras and lenses. This is especially true for view cameras where top quality really counts.

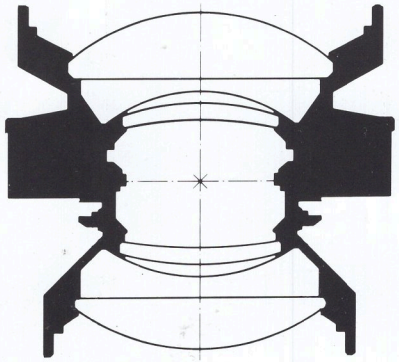
SINAR, maker of outstanding view cameras, is therefore collaborating with world-famous makers of top class lenses. The aim is to assure optimum quality matching of professional cameras and professional lenses.

Here are the critical parameters to consider when selecting a lens:

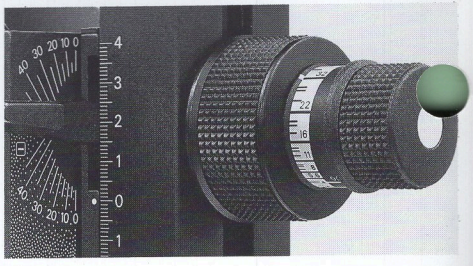
Optically:
- An optical design for best possible theoretical performance (optimum resolution, contrast, colour rendering, minimum light falloff, distortion and flare).
- Tightest tolerances and minimum deviations in the production of the lenses and their elements.



Mechanically:
- Matched rear and front groups mounted with minimum deviations in centering and separation.
- Lens fitted on lens board with closest to perfect centering and parallel alignment. Possibility of using behind-the-lens shutters.
- 100% final testing of every lens for image performance.

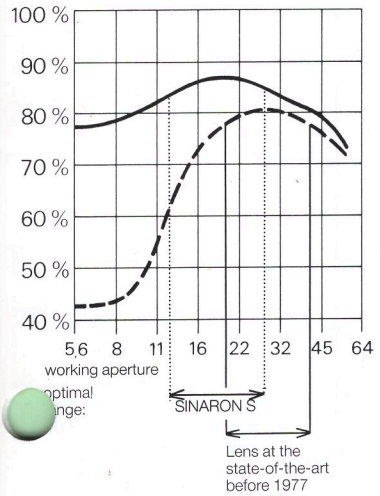


On the camera:
- Matched bearing points of the lens board and lens standard.
- Fully parallel image and lens standards when engaged at the camera's zero position.
- Minimum deviations between the optical register of the film plane, the ground glass screen plane and the image standard bearing points.
- Exact depth of field scale in the fine focusing drive, matching the lens diaphragm at the appropriate scale settings.



Why SINARON lenses for SINAR cameras?

MTF (measured at 5 line pairs/mm in the angle of field area of 54°)



— 210 mm SINARON S f/5.6, 72° angle
- - - similar 210 mm f/5.6 lens, 72° angle, older type

SINAR cameras are designed for photography of utmost quality. The SINARON lens range is matched to the camera and ideally meets such requirements.

The MTF curves illustrating the performance of SINARON lenses clearly show that a high-quality lens such as a SINARON yields optimum image quality within a specified aperture range (f/11 to f/32, best at f/22). With older lens designs – before the days of electronic computing and multicoating – you had to stop down the lens heavily to reduce aberrations arising from the lens design and production tolerances. That led to further quality losses due to diffraction effects.

That is why we need accurate control of sharpness distribution with a simple and precise focusing procedure. Hence it is important to be able to establish the required aperture with the aid of the depth of field scale in the camera's focusing knob.

No tilt: Setup needs considerable stopping down (to f/45 and beyond) – which impairs resolution (fig. A).
Inaccurate tilt: Still needs excessive stopping down (fig. B).
Accurate systematic tilt: Permits use of largest aperture derived from depth of field scale (fig. C).

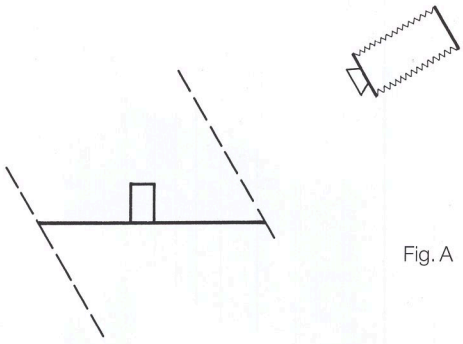


Fig. A

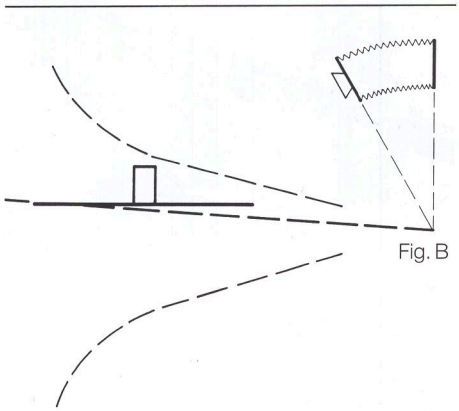


Fig. B

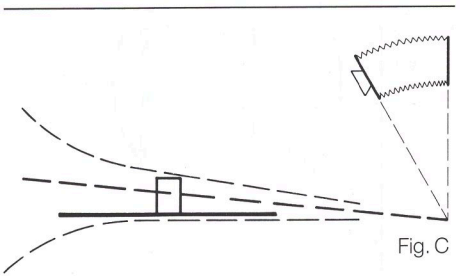
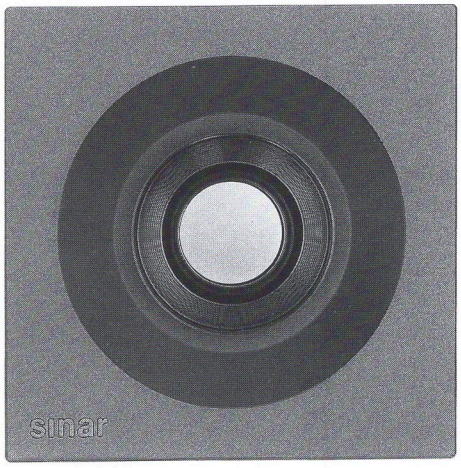


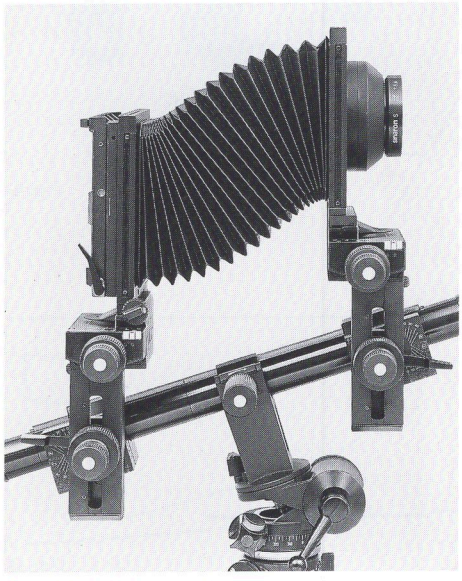
Fig. C

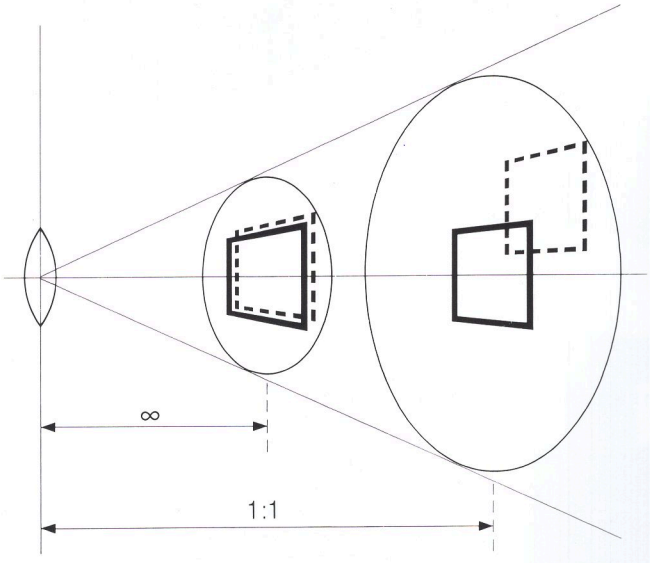
The SINARON lens range.



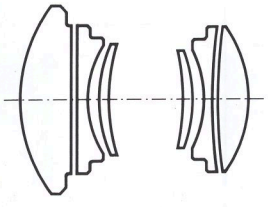
SINARON S standard lenses

To fill the image frame a standard lens needs an angle of field of about 53°. But the professional photographer also needs to be able to use shifts, swings and tilts without sacrificing image quality. The 72° angle of coverage of the SINARON S makes this possible. The image circle is about 45% larger than the diagonal of the film size – providing appreciable margin for the camera movements, yet with high edge performance.



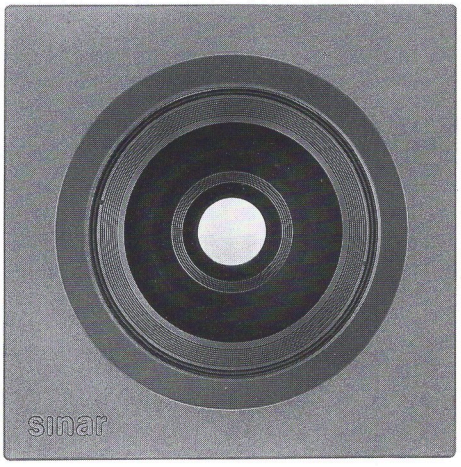


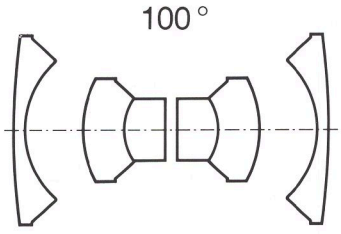
70–73°

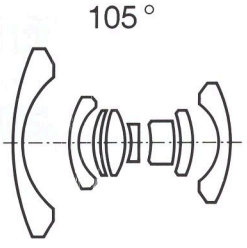


The SINARON S lenses

Focal length	Aperture	Angle covered at f/22	Front diameter mm	Filter thread	Rear mount diameter
135 mm	**1:5.6**	72°	42 mm	M 40.5 × 0.5	40.5 mm
150 mm	**1:5.6**	72°	51 mm	M 49 × 0.75	42 mm
180 mm	**1:5.6**	72°	60 mm	M 39 × 0.75	51 mm
210 mm	**1:5.6**	72°	70 mm	M 67 × 0.75	60 mm
240 mm	**1:5.6**	72°	80 mm	M 77 × 0.75	70 mm
300 mm	**1:5.6**	72°	90 mm	M 86 × 1	80 mm
360 mm	**1:6.8**	64°	110 mm	M 105 × 1	80 mm
480 mm	**1:9**	54°	115 mm	M 112 × 1.5	80 mm







SINARON W: wide-angle lenses

The large angle of coverage–over 100°–makes heavy demands on the optical design of the SINARON W lenses. The larger the angle, the more likely an optical system is to suffer from distortion. In the SINARON W distortion (at infinity) is kept below about 0.5% – in practice no longer noticeable.

The f/6.8 lenses are six-element systems on focal lengths of 75 mm, 90 mm, 115 mm and 155 mm. The eight-element f/4.5 version with a 105° angle of coverage at f/22 is available in focal lengths of 65 mm, 75 mm and 90 mm.

The 75 mm and 90 mm lenses exist in both speeds. The faster alternative provides a brighter ground glass screen image, even more uniform illumination and superior performance when using the shifts and swings.

The SINARON W lenses

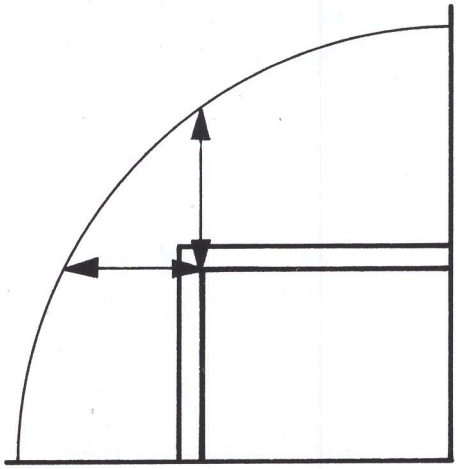
Focal length	Aperture	Angle covered at f/22	Front diameter mm	Filter thread	Rear mount diameter
65 mm	**1:4.5**	105°	70 mm	M 58 × 0.75	51 mm
75 mm	**1:4.5**	105°	70 mm	M 67 × 0.75	60 mm
75 mm	**1:6.8**	102°	60 mm	M 58 × 0.75	54 mm
90 mm	**1:4.5**	105°	85 mm	M 82 × 0.75	70 mm
90 mm	**1:6.8**	102°	70 mm	M 67 × 0.75	60 mm
115 mm	**1:6.8**	104°	85 mm	M 82 × 0.75	70 mm
155 mm	**1:6.8**	102°	110 mm	M 105 × 1	90 mm

Which focal length is suitable to which format?

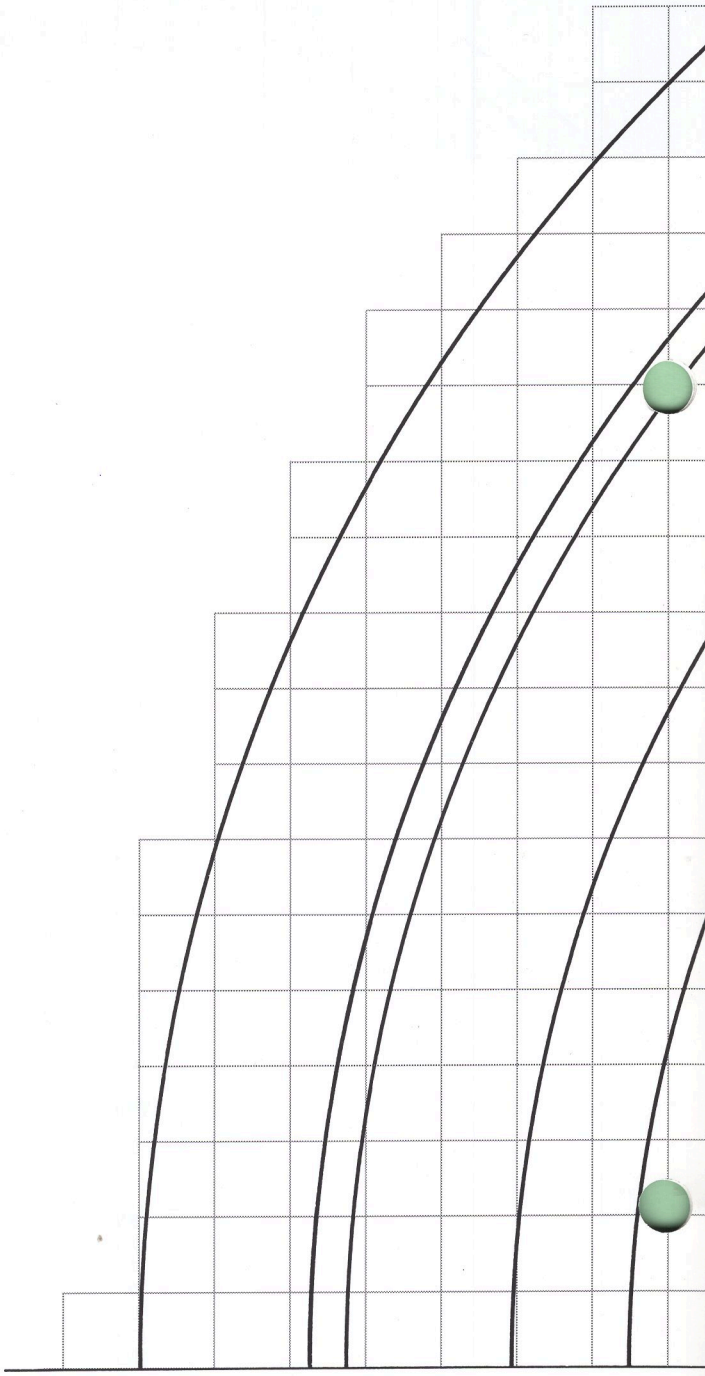
The image circle

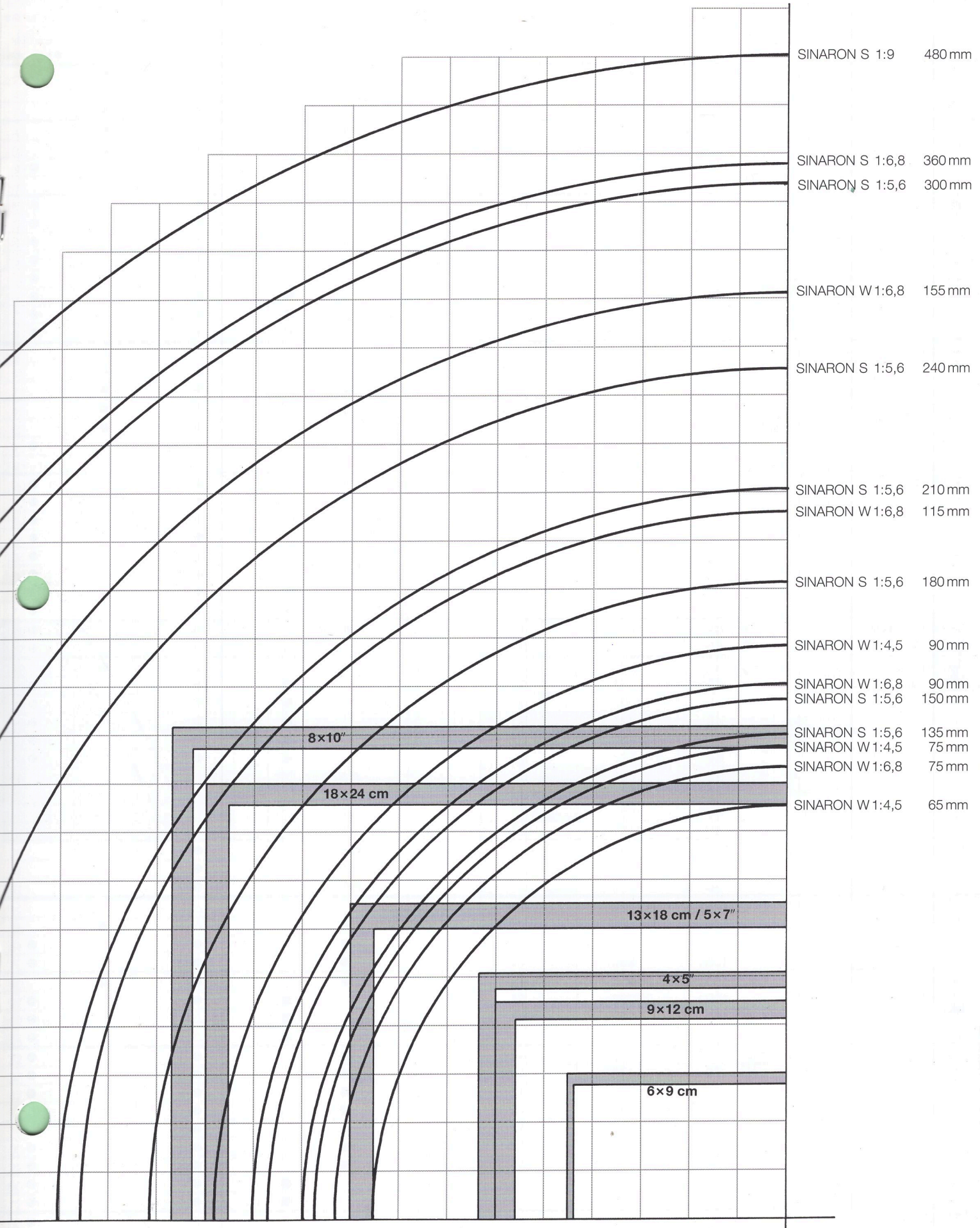
The diagram shows film sizes and image circles covered by different SINARON lenses and indicates the suitability of any SINARON lens for a given film size and the available shift range. The arc represents the image circle at f/22. The outer frame of the film sizes is the nominal (cm) format, the inner frame the film area utilised.

The illustration shows one-quarter of the full image area in natural size. You can thus directly measure available shifts with a ruler.



The film area utilised also depends on the film holder employed.




SINARON S 1:9 480 mm
SINARON S 1:6,8 360 mm
SINARON S 1:5,6 300 mm
SINARON W 1:6,8 155 mm
SINARON S 1:5,6 240 mm
SINARON S 1:5,6 210 mm
SINARON W 1:6,8 115 mm
SINARON S 1:5,6 180 mm
SINARON W 1:4,5 90 mm
SINARON W 1:6,8 90 mm
SINARON S 1:5,6 150 mm
SINARON S 1:5,6 135 mm
SINARON W 1:4,5 75 mm
SINARON W 1:6,8 75 mm
SINARON W 1:4,5 65 mm
8×10″
18×24 cm
13×18 cm / 5×7″
4×5″
9×12 cm
6×9 cm

The lenses

	Lens		Focal length in mm	Angle covered at f/22	Image circle diameter in mm at f/22[3])	Minimum aperture (for DB/DBM mounted lenses)	Shutter size COPAL 0 = 1/500–1 s 1 = 1/400–1 s 3 = 1/125–1 s	With auto aperture control ■ = available		With COPAL mechanical leaf shutter on simple board	Transformation in	
								DB	DBM		DB ● = available	DB or DBM ● = available
SINAR	SINARON W MC 1:4,5	1)	65	105	170	45	0	■		△	●	
		1)	75	105	195	45	0	■		●	●	
		1)	90	105	236	45	1	■		●	●	
	SINARON W MC 1:6,8	1)	75	102	187	45	0	■		●	●	
		1)	90	102	221	45	0	■		●	●	
		1)	115	104	291	45	1	■		●		●
		1)	155	102	382	45	1			△		
	SINARON S MC 1:5,6		135	72	200	64	0	■		●		●
			150	72	214	64	0	■		●		●
			180	72	262	64	1	■		●		●
			210	72	301	64	1	■		●		●
			240	72	350	45	3	■		●		●
			300	72	425	64	3		■	●		●
		1:6,8	360	64	435	64	3		■	●		●
		1:9	480	54	480	90	3		■	●		●
RODENSTOCK	Grandagon N MC 1:4,5	1)	65	105	170	45	0	■		△	●	
		1)	75	105	195	45	0	■		●	●	
		1)	90	105	236	45	1	■		●	●	
	Grandagon N MC 1:6,8	1)	75	102	187	45	0	■		●	●	
		1)	90	102	221	45	0	■		●	●	
		1)	115	104	291	45	1	■		●		●
		1)	155	102	382	45	1			△		
	Sironar-N MC 1:5,6		100	72	151	45	0	■		●		●
			135	72	200	64	0	■		●		●
			150	72	214	64	0	■		●		●
			180	72	262	64	1	■		●		●
			210	72	301	64	1	■		●		●
			240	72	350	45	3	■		●		●
			300	72	425	64	3		■	●		●
		1:6,8	360	64	435	64	3		■	●		●
	Makro-Sironar MC 1:5,6		210	64	350	45	3	■		●		●
			300	50	366	64	3		■	●		●
	Apo Ronar MC 1:9	2)	150	48	180	45	0	■		●	●	
			240	48	282	90	1		■	●		●
			300	48	352	90	1		■	●		●
			360	48	424	90	3		■	●		●
			420	42	430	90	3		■	●		●
		1:11	480	46	528	90	3		■	● 1:9		●
		CL	600	45	661	90		▲ NF				
		CL	800	42	806	90		▲ NF				
		CL 1:14	1000	40	969	128		▲ NF				
		CL 1:14	1200	40	1164	128		▲NF				
	Imagon H5,8		200	~ 40	145		3	● NF		●		
			250	~ 40	181		3	● NF		●		
		H6,8	300	~ 40	218		3	● NF		●		
SCHNEIDER	Super Angulon MC 1:5,6	1)	47	105	123		0			△		
		1)	65	105	170	45	0	■		△	●	
		1)	75	105	198	45	0	■		●		●
		1)	90	105	235	45	0	■		●		●
	Super Angulon MC 1:8	1)	90	100	216	45	0	■		●	●	
		1)	120	100	288	64	0		■	●		●
			165	100	395	45	3		■	△		●
			210	100	500	64	3		■	△		●
	Symmar-S MC 1:5,6 (Apo Symmar)		100	70	143	45	0	■		●		●
			120	70	173	45	0	■		●		●
			135	70	190	45	0	■		●		●
			150	70	210	45	0	■		●		●
			180	70	252	45	1	■		●		●
			210	70	294	45	1	■		●		●
			240	70	337	45	3	■		●		●
			300	70	411	64	3		■	●		●
		1:6,8	360	64	435	64	3		■	●		●
	Super Symmar HM MC 1:5,6		150	80	254	45	1	■		●		●
			210	80	356	45	3	■		●		●

Parallel displacement (horizontal format) in mm [3] For upright pictures the vertical ↑ and horizontal → displacements are interchanged. The values apply only when the lens is displaced from its centre position either horizontally or vertically.										Notes	Lens		
6×9 cm		4×5″		13×18 cm		18×24 cm		8×10″					
→	↑	→	↑	→	↑	→	↑	→	↑				
30	35	10	12	–	–	–	–	–	–	f/5.6 when using SINAR/COPAL shutter 521.31 infinity focusing of DB version 65 mm only with wide-angle bellows 2	SINARON W MC 1:4.5	1) 1) 1)	SINAR
49	59	25	29	–	–	–	–	–	–				
71	81	48	54	16	20	–	–	–	–				
45	55	20	24	–	–	–	–	–	–		SINARON W MC 1:6.8	1) 1) 1) 1)	
63	73	40	45	7	9	–	–	–	–				
99	111	77	85	47	57	2	3	–	–				
145	158	125	133	95	110	55	67	42	50				
52	62	28	32	–	–	–	–	–	–		SINARON S MC 1:5.6	1:6.8 1:9	
59	70	36	41	2	3	–	–	–	–				
84	95	62	68	30	38	–	–	–	–				
104	116	83	90	52	63	8	11	–	–				
129	141	108	116	79	92	37	46	23	28				
167	180	147	156	118	134	79	93	67	77				
172	185	152	161	123	139	84	99	72	83				
194	208	175	184	147	163	109	125	97	109				
36	45	10	12	–	–	–	–	–	–	f/5.6 when using SINAR/COPAL shutter 521.31 infinity focusing of DB version 65 mm only with wide-angle bellows 2	Grandagon N MC 1:4.5	1) 1) 1)	RODENSTOCK
49	59	25	29	–	–	–	–	–	–				
71	81	48	54	16	20	–	–	–	–				
45	55	20	24	–	–	–	–	–	–		Grandagon N MC 1:6.8	1) 1) 1) 1)	
63	73	40	45	7	9	–	–	–	–				
99	111	77	85	47	57	2	3	–	–				
145	158	125	133	95	110	55	67	42	50				
26	33	–	–	–	–	–	–	–	–		Sironar-N MC 1:5.6	1:6.8	
52	62	28	32	–	–	–	–	–	–				
59	70	36	41	2	3	–	–	–	–				
84	95	62	68	30	38	–	–	–	–				
104	116	83	90	52	63	8	11	–	–				
129	141	108	116	79	92	37	46	23	28				
12	30	146	156	118	134	79	93	67	77				
172	185	152	161	123	139	84	99	72	83				
129	141	108	116	79	92	37	46	23	28		Makro-Sironar MC 1:5.6		
137	150	117	125	87	101	46	56	33	39				
42	51	16	19	–	–	–	–	–	–		Apo Ronar MC 1:9	2)	
94	106	73	80	42	51	–	–	–	–				
130	142	109	117	80	93	38	47	24	29				
166	179	146	155	118	133	78	92	66	76				
169	182	150	158	121	136	82	96	69	80				
219	232	200	209	171	189	134	152	123	137			1:11	
285	300	267	277	239	258	204	224	193	210	With manual iris diaphragm instead of DB auto-aperture		CL	
358	373	340	351	313	333	278	301	269	287	With manual iris diaphragm instead of DB auto-aperture		CL	
440	454	422	433	395	416	361	385	352	372	With manual iris diaphragm instead of DB auto-aperture		CL 1:14	
537	552	520	531	493	515	460	485	451	472	With manual iris diaphragm instead of DB auto-aperture		CL 1:14	
23	30	–	–	–	–	–	–	–	–	With manual perforated stop instead of DB auto-aperture	Imagon H5.8		
42	51	17	20	–	–	–	–	–	–	With manual perforated stop instead of DB auto-aperture			
61	72	38	43	5	7	–	–	–	–	With manual perforated stop instead of DB auto-aperture		H6.8	
11	15	–	–	–	–	–	–	–	–	Available in Prontor Press shutter for SINAR handy	Super Angulon MC 1:5.6	1) 1) 1) 1)	SCHNEIDER
36	45	10	12	–	–	–	–	–	–	Infinity focusing only with wide-angle bellows 2: available in Prontor Press shutter for SINAR handy			
51	61	27	31	–	–	–	–	–	–	Available in Prontor Press shutter for SINAR handy			
70	81	47	53	15	20	–	–	–	–				
60	71	37	42	4	5	–	–	–	–	Available in Prontor Press shutter for SINAR handy	Super Angulon MC 1:8	1) 1)	
97	109	76	83	45	55	–	–	–	–				
152	165	132	140	102	117	63	75	50	58	Mounting into DB/DBM at factory only			
204	218	185	195	157	174	119	136	108	121	Mounting into DB/DBM at factory only			
22	28	–	–	–	–	–	–	–	–	Available in Prontor Press shutter for SINAR handy	Symmar-S MC 1:5.6 (Apo Symmar)		
38	46	12	14	–	–	–	–	–	–	Available in Prontor Press shutter for SINAR handy			
47	56	22	26	–	–	–	–	–	–				
57	67	33	38	–	–	–	–	–	–				
79	90	56	63	25	32	–	–	–	–				
100	112	79	86	48	59	4	5	–	–				
122	135	102	109	72	84	30	37	15	19				
160	173	140	149	111	126	71	84	59	68				
172	185	152	161	123	139	84	99	72	83			1:6.8	
80	91	58	64	26	33	–	–	–	–		Super Symmar MC 1:5.6	HM	
132	144	111	120	82	95	41	50	27	32				

Notes and symbols

DB ■ The DIGITAL and SINAR/COPAL shutters automatically control the type DB auto-aperture iris down to f/45.

DBM ■ These lenses have an additional manual control for setting still smaller apertures. Other type DB lenses with manual settings on application.

● Usable with any SINAR shutter, manual aperture settings.

▲ Freely usable with SINAR shutters only at f/22 or smaller, 1200 mm Apo-Ronar only at f/32 or smaller.

△ Usable only with COPAL between-lens shutters.

1) Preferably use an annular graduated filter to compensate optical vignetting (light fall-off) at the edge of the field. The following are available:

Code No.	(No.)	For Super Angulon lenses
440.99.034	(1)	8 /65 mm
440.99.012	(2)	5.6/47 mm
440.99.014	(3)	5.6/65 mm, 5.6/75 mm
440.99.038	(3a)	8 /90 mm
440.99.018	(4)	5.6/90 mm, 8/120 mm

Filter factor: 3×
(= –1½ EV steps)

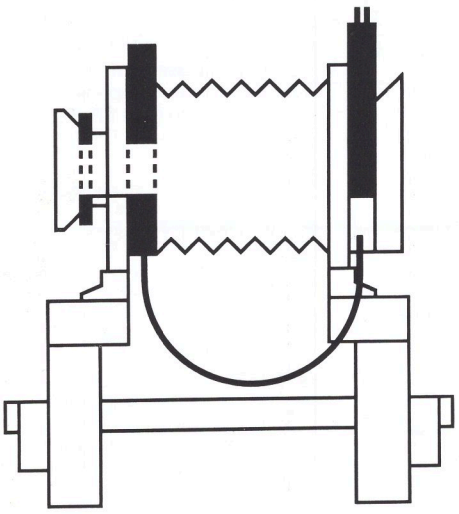
Code No.	For SINARON W and Grandagon lenses
440.99.236	6.8/75 mm, 4.5/65 mm
440.99.214	4.5/75 mm, 6.8/90 mm
440.99.218	4.5/90 mm, 6.8/115 mm
440.99.244	6.8/155 mm

Filter factor: 4×
(= –2 EV steps)

2) Further focal lengths and CL range on application.

3) The image circle and maximum displacements generally apply to lenses at f/22, focused at infinity. At a close-up scale of for instance 1:5 the image circle diameters are increased by 20%, at a scale of 1:1 by 100%. The image circle and the displacements apply to lenses Apo-Ronar and Macro-Sironar at f/22, focused at 1:3.

Why SINAR shutters permit closer shooting



The first view cameras had the shutter built into the lens, a tradition that has persisted to this day. So all lenses supplied by SINAR are available in a between-lens shutter. But this setup has distinct drawbacks. The photographer judges the image on the focusing screen from behind the camera. To adjust the aperture and shutter speed, or to tension the shutter, he has to keep going round to the camera front. With a bellows hood he must even remove the hood each time he wants to read off the settings – cumbersome and error-prone.

The SINAR behind-lens shutters do away with these problems. The cameraman sets the aperture and exposure time on large control knobs from behind the camera. And with an auto-aperture lens the aperture automatically stops down to its preset stop–in the way taken for granted in any SLR camera.

As the same shutter is used for all exposures, a given speed setting remains constant irrespective of the lens used.

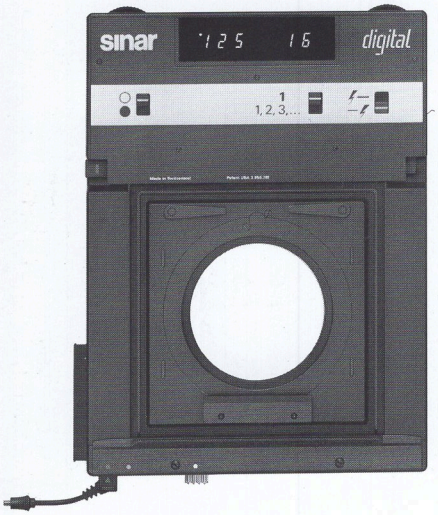
If you link the shutter with the ground glass screen back via an automatic cable, the shutter closes automatically as you insert the film holder in the back. After an exposure with the SINAR DIGITAL shutter you tension the shutter for the next shot. If you press the SINAR/COPAL shutter release, the shutter will first become tensioned, the aperture stops down and then the exposure takes place.

On removing the film holder from the camera, the shutter and aperture open again to show a brilliant screen image.

With a SINAR shutter you can of course also use lenses without auto-aperture facilities. In that case you set the working aperture manually on the lens itself.

The SINAR behind-lens shutters are usable with all lenses whose rear element is not larger than 80 mm in diameter.

concentration.



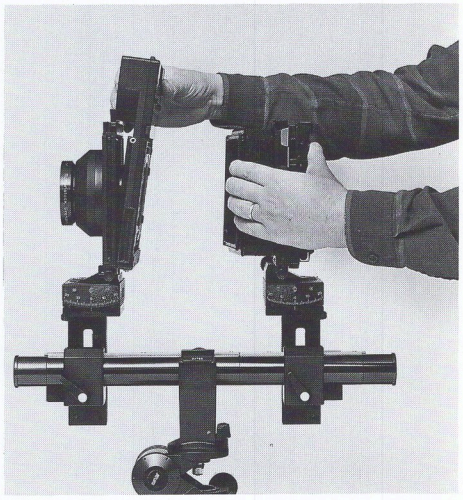
The SINAR DIGITAL shutter

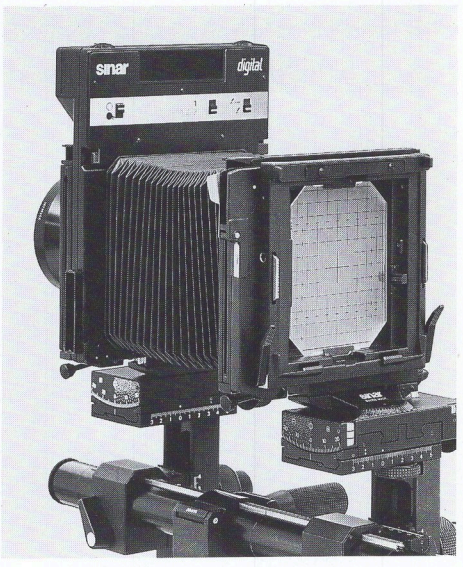
This is a microprocessor-controlled rotary blade shutter with comparatively few moving parts. That makes it far less trouble-prone than conventional mechanical shutters. The blade system employed assures absolutely uniform exposure from the image centre to the edges.

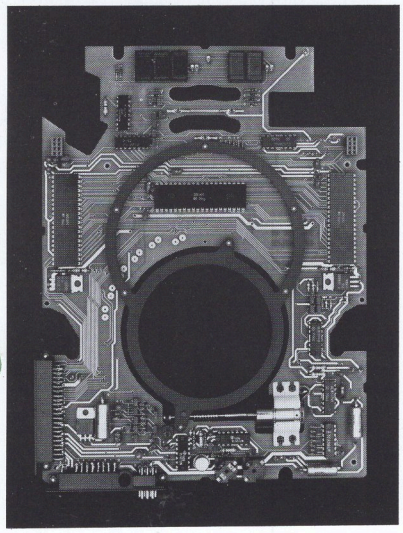
The automatic shutter speeds range from 1/500 to 80 sec. With SINAR DB auto-aperture lenses the shutter automatically controls apertures from f/4 to f/45. Still smaller apertures may be set manually on the lens itself. Convenient setting dials adjust the shutter speed and apertures in 1/3 step intervals; a digital display shows the settings. A code signals operating errors and possible faults. The shutter can synchronise flash either at the beginning or at the end of the exposure.

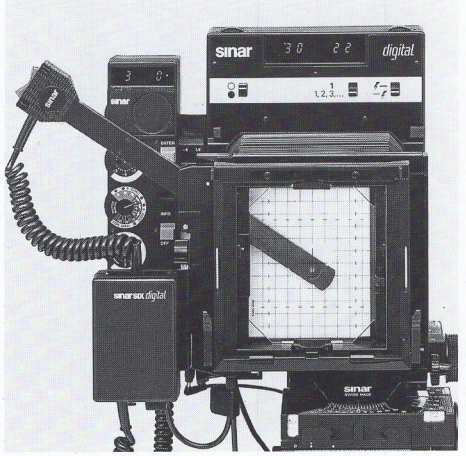
A rechargeable accumulator or an AC mains adapter powers the shutter.

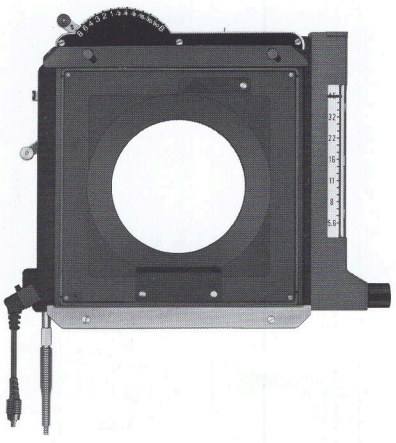
The SINAR DIGITAL shutter carries outlets for Modules that look after important exposure metering and control functions. These Modules are described in more detail in the SINAR 'Exposure meters' brochure.









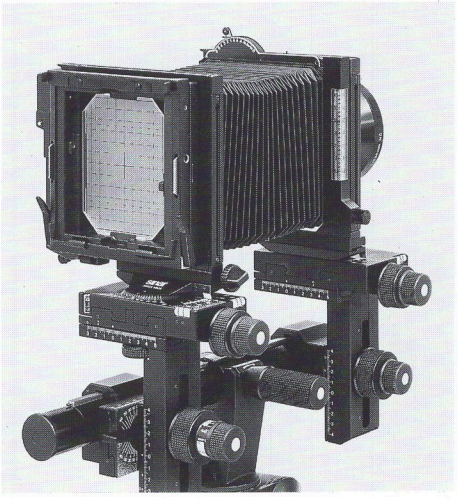


The SINAR/COPAL shutter

The SINAR/COPAL shutter is a mechanical leaf shutter operating with the same DB auto aperture control as the SINAR DIGITAL shutter. Auto aperture operation covers a range from f/5.6 to f/45. Still smaller apertures may be set manually on the lens itself. A stepless adjustment knob on the shutter preselects the working aperture.

The shutter provides speeds from 1/60 to 8 sec and B. It is X-synchronised at all shutter speeds.

A large scale shows the shutter speed settings from behind the camera, too.



Between-lens shutters

SINARON lenses are also available with COPAL between-lens shutters. The table on page 8 shows which lenses can be used with which shutters.

SINAR behind-lens shutters: Technical data.

	SINAR DIGITAL shutter	SINAR/COPAL shutter
Type	Electronically controlled behind-lens shutter with coupling for DB auto aperture control	Mechanical behind-lens shutter with DB auto aperture control
Shutter speeds	1/500 to 80 sec and B	1/60 to 8 sec and B
Flash synchronisation	1/30 to 80 sec and B Synch times with SINAR Module 2, lens stopped down by at least 2 stops: Rear glass diameter / Fastest synch speed 70 mm — 1/50 sec 55 mm — 1/60 sec 40 mm — 1/80 sec 30 mm — 1/100 sec	With synch cord, at all shutter speeds
Power supply	Rechargeable accumulator	–
Weight	1040 g or 36¾ oz (shutter only)	650 g or 23 oz (shutter only)
Basic outfit includes	522.11 SINAR DIGITAL shutter 522.11.002 Release and automatic coupling cable 522.11.005 Synch cord adapter with standard plug	521.31 SINAR/COPAL shutter 521.51 Automatic coupling cable 521.91 Bayonet connector for automatic cable 521.61 Cable release 522.11.005 Synch cord adapter with standard plug
Further accessories	Release and automatic coupling cables (various lengths) 522.11.006 Flash synch cord, 5 m (16½ ft long) 524.31 SINARSIX DIGITAL exposure meter with release and automatic cable 523.91 Shutter battery 523.11 SINAR rapid charger (110/220 V) + charging & supply leads 522.51 Module 2 for exposure computing and control for single-point, multi-point and contrast readings with automatic reciprocity correction 522.91 Module battery: powers SINAR DIGITAL shutter, Module 2 and SINARSIX DIGITAL	522.11.006 Flash synch cord, 5 m (16½ ft long) 525.11 SINAR Booster 1 meter probe for use with Minolta Flashmeter III and IV

The SINAR brochures

The camera

The SINAR p line
The SINAR f line
The SINAR system
The world of SINAR

SINAR Code

The Code illustrates and describes the function of every single SINAR component. The Code is the indispensable key to the SINAR system. It offers a clear overview over the world of SINAR

Lenses and shutters

Why SINARON lenses for SINAR cameras?
The SINARON lens range
Which focal length is suitable to which format?
The SINAR behind-lens shutters

Exposure meters

Spot readings in the film plane
Contrast control in practice
The SINAR booster 1
The electronic light metering system

Film holders

The SINAR rollfilm magazines
Sheet film holders

SINAR COLOR CONTROL filters

Vital points of filter use
Filters and the view camera
The SINAR COLOR CONTROL system

Extending the system

Stretching the limits
Making the most of the camera settings
Easier operation with sensible accessories

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